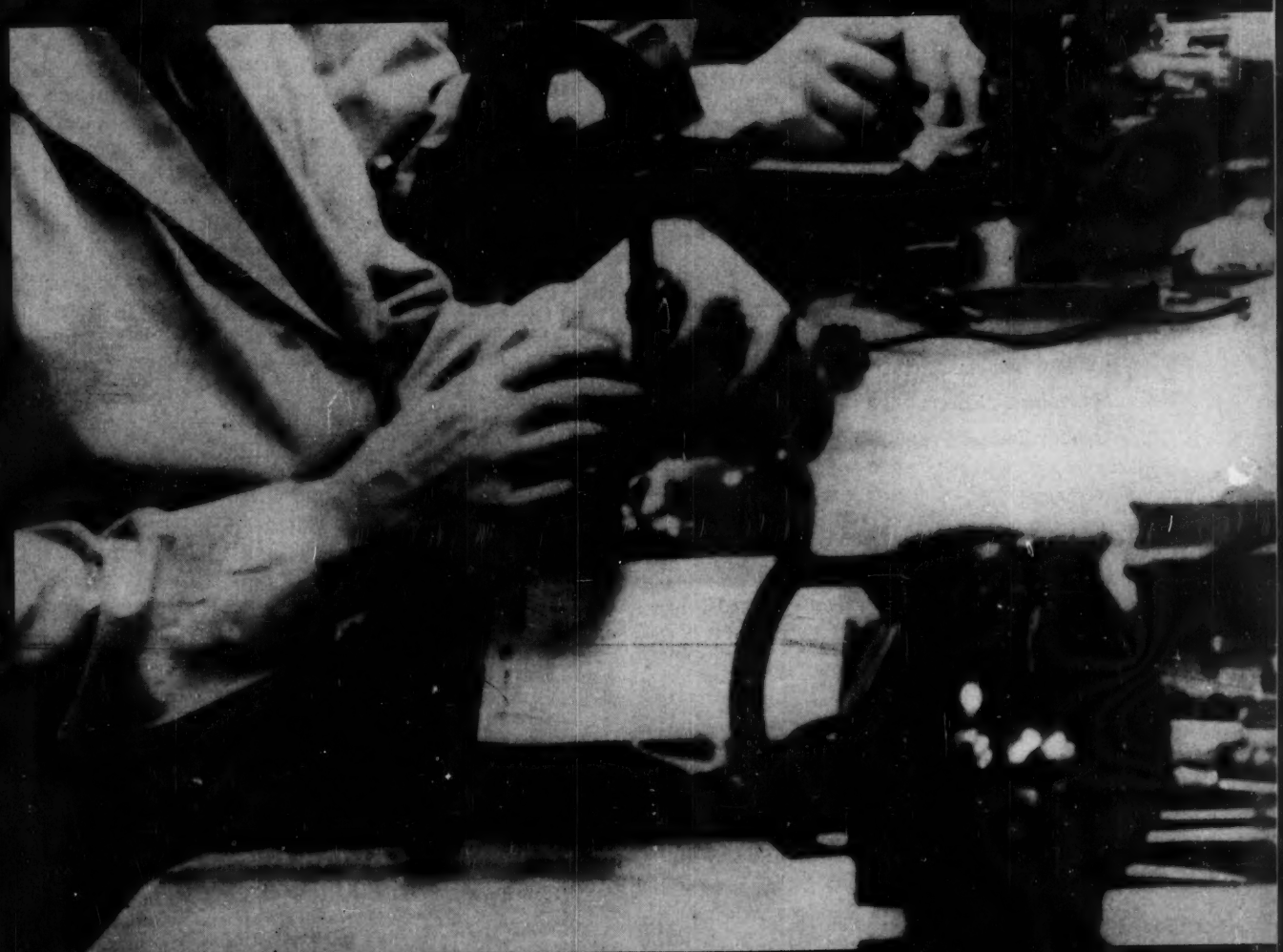
The Magazine of

STANDARDS



The Magazine of

STANDARDS

Formerly Standardization

OCTOBER 1954 Volume 25, No. 10

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MARGINAL NOTES

The Fifth National Conference on Standards —

A number of new and unusual events will be features of this year's National Conference on Standards to be held at the Roosevelt Hotel, New York, November 15-17. One of these will be presentation of achievement awards for work done on modular coordination, Monday morning, November 15.

Components for electrical circuits, electrical insulation material, power switchgear, electron tubes, and turbines are specific fields which will be described in the report showing what the Golden Jubilee of the International Electrotechnical Commission meant to the American electrical industry, Monday afternoon.

A symposium on standards for agriculture and horticulture will also strike a new note at the Conference, Tuesday afternoon, November 16. Of interest to all amateur gardeners as well as to large-scale farmers, the symposium will take up problems of seed quality factors and seed standards, standards for the quality of nursery stock, and uniform standards for florists' cut flower crops. Work now under way on common names for pest control chemicals in ASA sectional committees and in an international committee will be discussed in relation to the general problem.

Another unusual session will be that on color television, Wednesday, 9:30 A.M., November 17. This is sponsored by the Radio-Electronics-Television Manufacturers Association, with Axel Jensen, Bell Telephone Laboratories, presiding. The National Television System Com-

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Reg. U. S. Pat. Off.

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Opinions expressed by authors in THE MAGAZINE OF STANDARDS *are not necessarily those of the American Standards Association.*

mittee will be discussed as an example of systems engineering and use of industrial standards. The derivation of the FCC color television standard will be explained.

In another innovation, the technical and business press have been asked to give those attending the Conference their analysis of what's ahead for standardization, Wednesday morning. The press representatives are in the most advantageous position to see the over-all picture of the effect of the radical changes now taking place.

Other sessions will discuss safety standards as a demonstration of industrial self-government, and consider the status of standards for conservation of hearing in industry (Monday afternoon), and will evaluate the results of a quality control program in the plant (Tuesday morning). The Company standardization session (Tuesday, all day) will define the areas of standardization, take up recent developments in surface finish standards, and also consider what the purchasing agent wants from the engineer in standardization.

The Howard Coonley Medal and the Standards Medal will be presented at the Awards Luncheon, Wednesday, November 17.

Those attending the Conference are invited to visit the "get acquainted" lounge, Room D, adjacent to the Ballroom on the Mezzanine Floor, from 8 A.M. to 11 P.M., Nov. 15-16.

The complete program and information on registration can be obtained by writing the American Standards Association, 70 E. 45 Street, New York 17.

Correction —

Following publication of their article on "Positional Tolerancing of Manufactured Parts" (THE MAG OF STDS, June, 1954, p 180), Allan H. Candee and Craig Telfer have indicated there is an error in Figure 2. Pins "C" should be 0.496 $^{+.000}_{-.003}$ dia instead of 0.494 dia $^{+0.006}_{-0.003}$ as originally given.

In the September issue, page 291, Table III, under the heading Male End, CM, Max, change fourth figure in column from .625 to .656.

This Month's Standards Personality

Charles Rufus Harte

Salty humor, a keen wit, and a gay twinkle have made Charles Rufus Harte an enlivening asset to every group with which he has been affiliated in the 61 years since he was graduated as a Civil Engineer from the Columbia University School of Mines.

Perhaps these characteristics, as well as his capacity for getting things done, have had something to do, too, with his long career with one organization—The New York, New Haven and Hartford Railway and its subsidiary, the Connecticut Company. He started with the New Haven on his first day of work in 1893 and continued with it and the Connecticut Company until the day he retired in 1951. This does not by any means imply stagnation—activity is the keynote of Charles Rufus Harte.

Starting his career in the era of the steam railroad, he moved with the times from steam locomotives to electric trolleys and from electric trolleys to bus transportation.

Electrification of rail transportation was pioneering work in 1901 when Charles Rufus Harte first started with it. Over the next few years he was largely responsible for the many miles of interurban lines which at one time made it possible to travel from New York to Boston on trolley cars operated by the Connecticut Company. For a short time his specialized experience and knowledge were called upon by other communities and he supervised extensive trolley developments in Nova Scotia and in Ohio. He was also called on for development of power plants, both steam and hydroelectric.

As bus transportation moved in to replace trolleys, Mr Harte took charge of construction for the Connecticut Company, including some of the largest bus garages in this country. He finally was responsible for removal of the very trolley systems he had helped to build. Thus his career spanned the entire duration of the trolley industry.

Mr Harte has contributed much to standardization in his career.

One of his first experiences with the need for standards was when he found specifications for overhead electric railway construction were needed. Despite opposition, he brought together manufacturers of the materials and the contractors, thus making it possible to prepare the needed code. This was a pioneering step in standardization in the electric railway industry.

Since 1923 he has been one of the leading spirits in what is now the American Standards Association. He was chairman of the committee which drafted the present Constitution and Rules of Procedure of ASA. He was largely responsible for organization in 1926 of the Electrical Advisory Committee now known as the Electrical Standards Board and has continuously been their chairman. He encouraged the amalgamation of the United States National Committee of the International Electrotechnical Commission into the electrical standards program of ASA.

Although retired from his business, Mr Harte is so busy it is difficult to arrange an appointment with him, and he still finds it hard to follow up his hobby —old New England gravestones.

THE FIFTH NATIONAL CONFERENCE ON STANDARDS

Hotel Roosevelt *November 15, 16, 17*

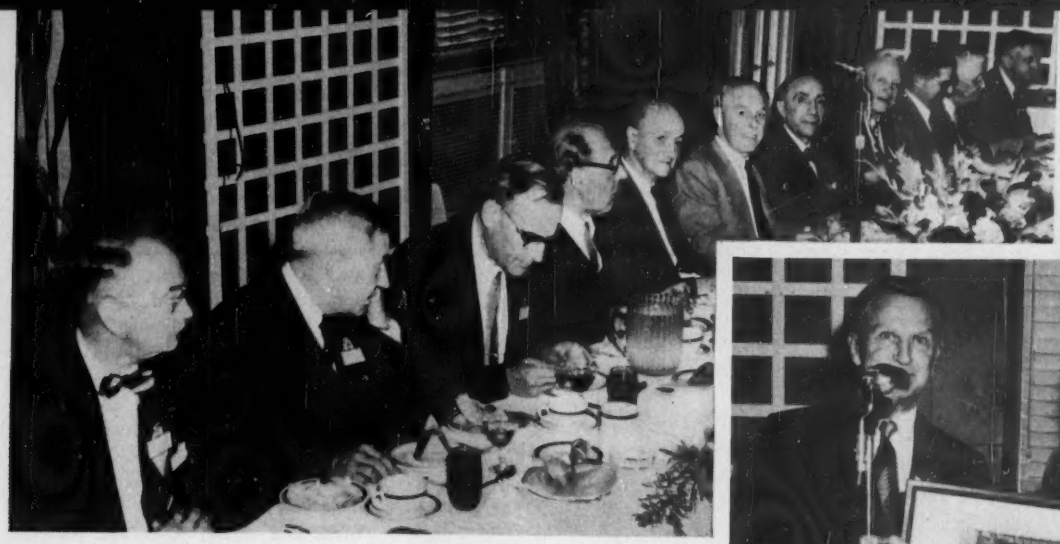
J. G. Daruty de Grandpré, *chief of technical service, Electrical Construction Co, Paris, made a jelly roll when delegates visited General Electric Appliance Co. Kitchen appliances were demonstrated.*

One of the technical committees *that held sessions during the IEC meetings at Philadelphia. Delegates from 11 countries attended meetings of TC 31 on Flameproof Enclosures. Professor Leon L. Brison (Belgium) was chaiman; J. F. Stanley (United Kingdom) was secretary; and Peter Bingley (UK) was assistant secretary. This picture shows USA delegation at far left.*

Golden Jubilee banquet, *The Bellevue Stratford, Philadelphia, September 9. Presiding —R. C. Sogge, President, U.S. National Committee. Toastmaster—Walker L. Cisler, president, the Detroit Edison Company. Speakers — A. C. Monteith, president, American Institute of Electrical Engineers; Don G. Mitchell, Chairman, Board of Sylvania Electric Products, Inc; Dr J. M. Thomson, Ferranti Electric Ltd, Toronto; Dr Arnold Roth, President, Swiss Electrotechnical Committee.*

Commemorating IEC's Golden Jubilee *(picture above), Dr Hilding Törnebohm, president of the International Organization for Standardization (right), presents gold plate to Dr H. S. Osborne, IEC president.*

Stanley Bernard Warder, *Chief Officer, British Transport Commission (picture at right), shakes hand with E. R. McCarthy, fireman of the IEC Special, which carried 360 delegates from 15 countries to Washington, D.C. Looking on are L. A. M. Ginger, London Transport Executive, London, England; General Pierre O. Salmon, Commissioner of Standardization of France; and David W. Wells, Executive of the British Railways, London.*



Jubilee Day luncheon *honored three pioneers of 1904 meeting—Professor Comfort A. Adams; Irving E. Moultrop; and A. L. Pierce. At head table (left to right) R. C. Sogge; Dr Lee A. Du Bridge; Dr H. Sterky; The Right Honorable Viscount Waverley; Professor Adams; Dr Percy Dunsheath; Professor J. A. DeArtigas; Mr Moultrop; Pierre Ailleret; Mr Pierce; Dr Harold S. Osborne.*

Dr J. A. DeArtigas *(right), chief of Spanish delegation, presented photograph of IEC members at 1913 meeting, Berlin, to Dr H. S. Osborne, president, International Electrotechnical Commission.*

A Report on

A Great International Standards Meeting

by VICE ADMIRAL GEORGE F. HUSSEY, JR, USN (RET)

*Managing Director, American Standards Association**

Among all the impressive statistics of the 50th anniversary meeting of the International Electrotechnical Commission, held in Philadelphia September 1 through 16, one figure stands out above all others.

No fewer than 43 International Recommendations were brought to the final stages of approval at the meeting. This is more world electrical standards than the IEC had produced in its 50-year history.

Thus in terms of results achieved, the IEC meeting was notably fruitful. It was equally successful in terms of attendance, smoothness of operation, and international good will achieved. I am convinced that so many international agreements could have been reached only in the atmosphere of harmony that prevailed in Philadelphia.

The statistics of the meetings speak for themselves.

More than 800 delegates, plus several hundred members of their families, attended. They came from 21 nations.

The United States had the largest delegation with 352 persons, followed by Great Britain with 96, France 46, Italy 36, Sweden 35, The Netherlands 32, and Switzerland 20. The Soviet bloc of nations did not attend.

A total of 258 morning and afternoon sessions were held by the 49 IEC technical committees that met.

Twelve technical trips were made to industrial plants in and around Philadelphia. Some 440 delegates made a two-day field trip to Washington, where they toured the National Bureau of Standards and were feted at a luncheon attended by business and government officials.

At the Jubilee Banquet, attended by 625 persons, A. C. Monteith welcomed the gathering as president of AIEE. Walker Cisler, Detroit Edison, was toastmaster and Don Mitchell, Sylvania Electric Products, delivered the main address, "Standardization, Foundation of International Progress." Richard C. Sogge, General Electric Company, president of the U.S. National Committee of the IEC, presided.

At the Jubilee Day luncheon, Dr Comfort A. Adams, past president of the AIEE and first president of the American Standards Association, was guest of honor. He is one of the three living U.S. founding members of IEC and is the only survivor among those Americans who read papers at the St Louis meeting in 1904.

Dr Harold S. Osborne, former

*The American Standards Association accepted administrative responsibility for the international meeting described in this report. It furnished 34 full-time staff members from its New York office throughout the meeting. Fourteen staff engineers from the National Electrical Manufacturers Association also served on a full-time basis.

chief engineer of the American Telephone and Telegraph Company, president of IEC, presided at the Jubilee Day ceremonies.

The 43 International Recommendations acted upon fall into three categories.

Six were approved in final form and sent to the printers, as follows:

The third edition of Publication No. 48, Rules for Electrical Traction Motors, embodying modifications to the second edition which had been approved.

First edition of the Specifications for Electrical Equipment Installed on Motor Vehicles.

Part I of Chapter II of the Specifications for High Voltage Circuit-Breakers, which, it was agreed, should be published as it stands and differences existing between the U. S. National Committee on the one hand and the other National Committees on the other hand should be re-examined in a few years' time, when a complete second edition of the specification is prepared.

First edition of the Rules for Porcelain Insulators for Overhead Lines, after revision of the present draft by an editorial committee.

Electronic Tube and Valve Bases.

Electronic Tube and Valve Outlines.

Nine International Recommendations are to be circulated for final reconsideration by mail vote within two months by all IEC National Committees. These include:

Specifications for paper dielectric capacitors.

Color code for paper dielectric capacitors.

Specifications for tubular fluorescent lamps.

Standards sheets: Medium and large prefocus lampholders.

Specification for ballasts.

Rules for glass insulators for overhead lines.

Supplement to Publication 67, Part I.

Bases for Electronic Tubes and Valves.

Tests on impregnated, paper-insulated, lead-covered cables (solid type) for voltages of 10 Kv to 66 Kv, which will be revised to include the amendments agreed upon at Philadelphia before being circulated.

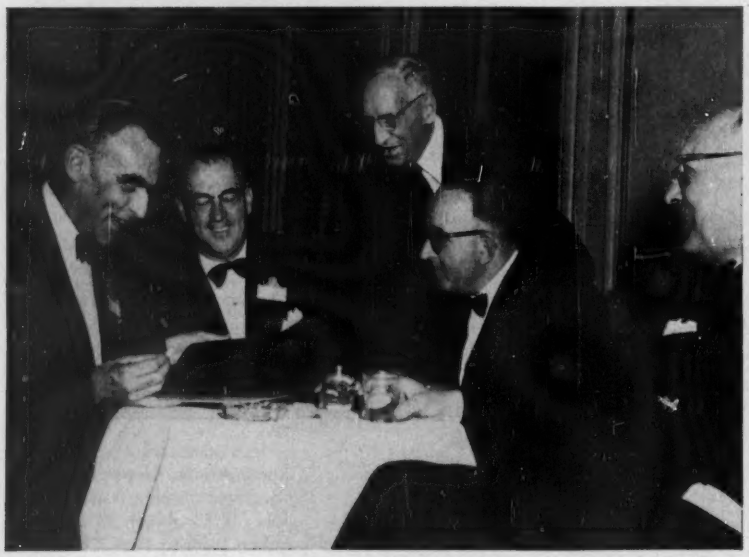
Construction of the enclosures of flameproof electrical apparatus, which will be revised to take into account the technical and editorial improvements agreed on before being circulated.

Finally, 28 International Recommendations are to be circulated for final approval by mail vote within six months by all IEC National Committees. These include:

Groups 65 and 70 of the International Electrotechnical vocabulary covering electrobiology and radiology; recommendations for classification of insulating materials; rotating machinery; specifications for steam turbines; four standards on aluminum; eight standards on radio communications; volume and surface resistivity and insulating resistance test methods; electric and magnetic magnitudes and units; audio-apparatus — characteristics to be specified for application purposes; supplement to IEC specification for tungsten filament lamps having a life of 2500 hours; gages for interchangeability and safety of comps and holders, Types E27 and E40; ceramic caps, small and medium; dimensions of subminiature tubes and valves, bases and outlines; caps for electronic tubes and valves; and others.

The following statements were notable among the many addresses delivered during the 16-day meeting.

Don Mitchell, at the Jubilee Banquet: "If atomic energy is used principally as a source of heat, to run conventional generating equipment, the industry will certainly not undergo any drastic revolution. However, the story will be different if an efficient and practical method is developed for generating electric power directly from atomic energy. Such an achievement would change the entire concept of power distribution,



Dr Hakan Sterky, *Director General, Royal Board of Swedish Telecommunications; A. C. Monteith, President, American Institute of Electrical Engineers; Philip Chase, Philadelphia Electric Co, Chairman, General Committee, IEC Jubilee; Louis Ruppert, Secretary, IEC; Dr Hilding Törnebohm, president, ISO.*

Don G. Mitchell, *chairman, Board of Sylvania Electric Products, Inc, was a principal speaker at IEC Jubile Banquet. He discussed the changes that the peaceful use of atomic energy might make in the electrical industry.*

and widespread distribution networks could conceivably become outmoded . . .

"There are countless other aspects of atomic energy we could explore —its effects on medical science, agriculture, the textile industry, and many others. If there were any frontiers as far as world progress is concerned, atomic energy has pushed them back out of sight.

"Just how rapidly atomic energy is put to work to serve man, rather than to destroy him, will depend upon the degree with which technical information flows throughout the world. Standardization will be a major factor in expediting that flow. In fact, without standardization, success will be impossible."

Jubilee Day speakers, *afternoon session (left to right) Sir Vincent DeFerranti, representing World Power Conference; Right Honorable Viscount Waverley, United Kingdom; Charles E. Saltzman, Under Secretary of State for Administration; Dr H. S. Osborne, President, IEC; Dr Lee A. Du Bridge, President, California Institute of Technology; General E. E. Wiener, Belgium.*

Viscount Waverley of England, former Chancellor of the Exchequer, Home Secretary, and president of the British Standards Institution: "The increasing complexity and variety of electrical equipment today call for greater efforts towards international understanding and agreement not only on definitions but also on assessment of performance and testing. Otherwise, the safety and other regulations of one country —necessary as they are—may form a serious barrier to imports and prevent the dissemination of the best practices and techniques.

"The existence of independent national standards which are not basically comparable can seriously cripple international trade and reduce the efficiency of national industries which have to produce a variety of types of the same article for different markets.

"There may indeed be some temptation to use national standards as a protective device in the interests of the home producer. This would clearly be a gross misuse of standards and of the knowledge and effort that go to their establishment. More, it would be a shortsighted policy in the interests of manufacturers themselves. Clearly the demand in world markets for sound, well-designed electrical installations will be accelerated if, through greater standardization, the material and apparatus can have a more general application and can be produced and then maintained at lower cost."

Dr Hakan A. Sterky, director general, Swedish Administration of Telecommunications: "The first telephone cables connecting Europe and America . . . will be established between Oban in Scotland and Newfoundland over a distance of about 2000 nautical miles, by means of two coaxial cables. From Newfoundland to Nova Scotia a single submarine cable will be laid over a distance of 310 miles. In Scotland access will be obtained to the GPO network and thus also to the rest of Europe.

"All North American subscribers will be reached via microwave radiolinks from Nova Scotia to New York and Montreal. Submarine repeaters, containing electronic valves with an estimated lifetime of more than 20 years, and designed to withstand sea pressure up to five tons per square inch, will be placed at intervals of 40 nautical miles. The power to operate the amplifiers will be supplied through the coaxial cable center conductor from the terminal stations.

"No large body of land on earth is separated by more than 290 miles from some other body of land. This is a simple fact of geography, but it has today inspired a vision which is no less than revolutionary in its implications for communication between men the world around.

"It is a vision which seems, at first sight, as if it had been conjured up by science fiction: intercontinental television, passing over oceans and into areas which today are still dependent on the river steamer and the monthly mail pouch; instantaneous telephone conversation with any part of the globe, penetrating into jungle wilderness where today the beat of native drums is the sole source of human communication; walkie-talkie connection between the manager of a Malayan rubber plantation and his home office in the City of London. Futuristic as all this may seem, there is nothing fictional about it. As a matter of hard, technical fact a complete global communications network—both visual and auditory—could be erected."

President Eisenhower, in a telegram read at the farewell luncheon: "The 50-year record of the IEC shows clearly the mutual benefits which come when nations and men of good will can share their problems in friendly and equal partnership."

The Three Principles of the British System of Tolerancing

PRINCIPLE 1: When the geometric or positional tolerance note includes the designation MMC, it indicates that the stated tolerance applies only at the maximum metal condition of the part.

For example, Fig. 1 illustrates a pin whose actual size may vary from 0.990 to 1.000 diameter. It also includes a note which specifies a geometric tolerance of straightness of 0.005. Such a note would mean that if the size of the features are at their maximum metal size, the geometric or positional tolerance cannot vary beyond the value specified. However, if the size of the features are less than maximum metal size, an increase of geometric or positional tolerance is available and permissible.

In the worst condition, this pin will just be able to enter a truly cylindrical hole of 1.005 diameter, as shown in Fig. 2. However, if the pin is finished to a size other than its maximum metal limit, as for example 0.990, there will be an increase in the assembly clearance. In this case a larger straightness tolerance than that stated on the drawing could be allowed as shown in Fig. 3 without endangering free assembly. This increase of geometrical tolerance is equal to the difference between the specified maximum metal limit of size and the actual finished size of the feature.

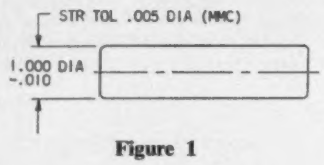


Figure 1

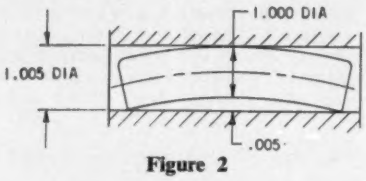


Figure 2

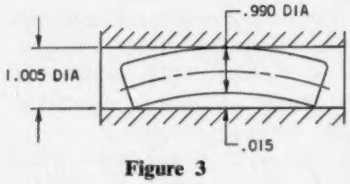


Figure 3

PRINCIPLE 2: When the geometric or positional tolerance specified on the drawing is to be machined within the expressed limit, regardless of the actual finished sizes of the features concerned, the designation MMC is omitted.

The tolerance note is expressed as shown in Fig. 4. This note means that the surface or the axis of the feature must in all cases be within a tolerance zone whose diameter is the value specified. See Fig. 5 for interpretation.

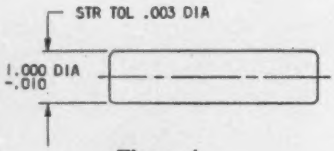


Figure 4

Figure 5

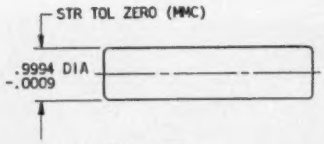


Figure 6

PRINCIPLE 3: When it is necessary to contain the specified geometric or positional tolerance within the maximum metal limits of the features, the tolerance note should state a requirement of ZERO (MMC). See Figure 6.

Such a note would mean that if the features are finished everywhere on their maximum metal limits of size, they must be perfect in form (truly straight, square, concentric, and so forth). However, errors of form are permissible if the features are away from their maximum metal limits of size in the direction of minimum metal.

The use of a 'ZERO' tolerance in Principle 3 met with strong objection from all segments of industry, mainly because it was foreign to American practice and because of its adverse psychological reaction on manufacturing people. Also, the fundamental concept established by this principle has been recognized in U. S. industry by the common interpretation of size limits. If there are no specific form tolerance requirements specified on the drawing, the part is acceptable if it is within the size limits.

These size limits define a tolerance zone or boundary which restricts not only the size but also the allowable variations in geometric form. In such cases, if a part is to maximum metal size, it follows that it must have no variations from true form (equivalent to ZERO MMC) to pass conventional inspection methods. On this basis, therefore, it was decided that consideration would be given only to the detailed study of the application of the first two principles.

Drafting Practice and More Realistic Tolerancing

by P. G. BELITSOS

General Electric Company

When Allen H. Candee and Craig Telfer wrote the article "Positional Tolerancing of Manufactured Parts" (MAG of STDS, June 1954, p 180), they raised an interesting question for discussion. At the request of a number of those closely concerned with the subject, THE MAGAZINE OF STANDARDS is pleased to publish this article by P. G. Belitsos, representing a progress report on the work done by the Joint SAE Drafting Committee comprised of representatives of both SAE aeronautical and automotive groups. Its recommendations, in the form of a proposed SAE Dimensioning Standard, has been referred to ASA Committee Y14 on Drawings and Drafting Practice. It is now under consideration by Y14's Subcommittee 5 for possible incorporation in the draft American Standard on Dimensioning and Notes for which it is responsible. Subcommittee 5 has scheduled its work to have a draft ready for consideration by the Y14 Executive Committee in February, 1955.

The article by Mr Belitsos as presented here is a slightly shortened version of an article which appeared in the SAE Journal *in August, 1954.*

Mr Belitsos, General Electric Company, is a member of both the SAE Joint Aeronautical and Automotive Drafting Committee and of Y14's Subcommittee 5.

IT has been said by many authorities that the standardization of engineering drawing practice in America, Britain, and Canada is probably the most important single step that these three democracies could take to make better use of their combined resources.

This would make possible a common language for the expression of engineering requirements which would reduce the loss of valuable time and money required to translate the drawings made in one country into the practices used by another. To accomplish this standardization is a gigantic undertaking. But it is well under way and should be successfully completed based on the precedent established by the adoption of the Unified Screw Thread Standard by these same ABC countries.

Joint SAE Committee

In September, 1952, the American Standards Association, in a meeting of its Sectional Committee Y14 on Drawings and Drafting Room Practice, asked various industries to study a proposed British Standard (BS308) on Engineering Drawing Practice.

Each of these groups, including the aeronautical and automative industries, carefully reviewed this standard in separate meetings to determine their respective positions regarding the practices established by the British Standards Institution. It was agreed by all that, in general, the basic principles were consistent with American practice but that the British introduced some new concepts, particularly in the field of positional and geometric tolerancing which had much merit and required further intensive study and comparison with American practices.

(Positional Tolerance is the permissable variation in the specified location of features of a part from each other and/or from a common datum. Geometric tolerance is the permissible variation in specified form of the individual features of a part.)

The drafting representatives of the SAE aeronautical and automotive groups subsequently decided that much could be accomplished in the way of establishing a basis for American drafting practice if they could agree on a common drafting standard on dimensioning and tolerancing, with particular emphasis on geometric and positional toleranc-ing. Accordingly, a joint SAE Drafting Committee was formed to accomplish this.

The initiation of this activity was timely because of the experience gained by many companies in the multiple source programs inaugurated by the Government after the start of the Korean war. In building products such as aircraft gas turbine engines by many automotive companies, it became evident that there were many differences in automotive and aeronautical drafting practices which could be reconciled without much difficulty.

Each company involved in this study appreciated the urgent need to arrive at a common understanding for defining engineering requirements on drawings. From experience during the war with expanded subcontract operations, it also became apparent that drawings prepared for use in workshops of widely varying equipment and experience required more complete and explicit dimensioning and tolerancing expressed in terms that required no interpretation.

Basic Principles for Tolerancing

After considerable study, it became apparent that the foundation of the British system of geometric and positional tolerancing could be reduced to three basic principles. Before stating these principles it will be well to sketch briefly a background of the requirements for dimensioning for interchangeability.

When two mating parts are to assemble on an interchangeable basis it is necessary to dimension the fits to suit the functional requirements of the design and at the same time permit universal exchange of parts

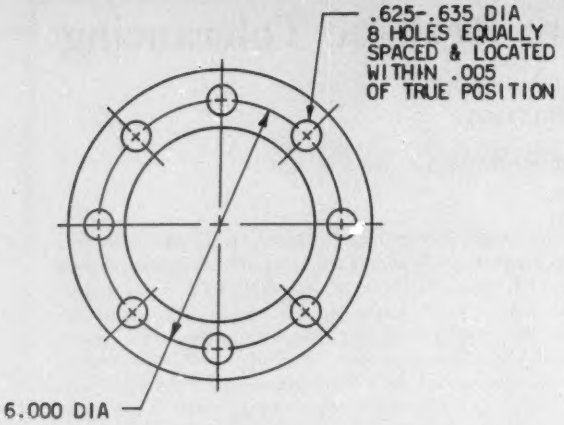


Figure 7—*In this case, the true position of each hole is determined from the basic bolt hole diameter and the basic angular relationship established by the drawing note.*

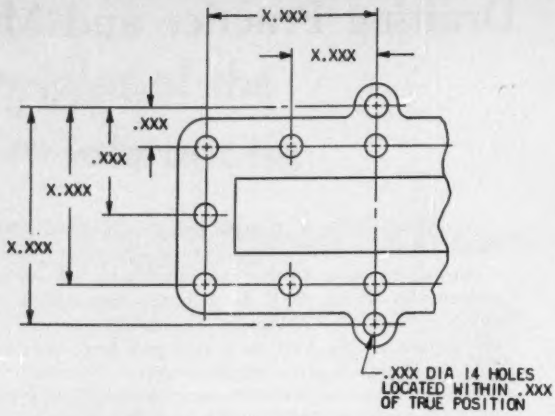


Figure 8—*Here the true position of each hole is determined by the use of basic rectangular coordinate dimensions.*

without the necessity of fitting at assembly. In manufacturing parts for interchangeable use, it is recognized that there will be variations in the actual size of each part within the specified limits; and owing to the inaccuracies of the machinery and equipment, there will also be errors in the form or position of the features of each part.

The least favorable condition for the assembly of mating parts occurs when the mating features such as holes, pilot diameters, slots, and so forth, are at their maximum metal condition of size, and the maximum variations permitted by geometric or positional tolerancing are present. (Maximum metal condition [MMC] is that limit at which a part contains the maximum amount of material. This would be the maximum external limit and the minimum internal limit.)

In establishing the following three basic principles, the British recognized the need for specifying directly on the drawing the relationship between the geometric or positional tolerance and the size tolerance. These three principles are discussed below.

True Position System of Dimensioning

To determine the SAE position on these principles, it was decided to take some typical SAE drafting practice which embodied all the basic elements involved in this study, analyze the existing practice, and modify it to incorporate the latest advances in tolerancing methods used in this country and abroad. The true position system of dimensioning groups of cylindrical features was selected because it incorporated the most advanced techniques for the dimensioning of mating parts which have to assemble on an interchangeable basis. It was also particularly suitable since it was recognized: (1) by the British Standards Institution in BS308, (2) by the Canadian Standards Association in CSA B70.1, (3) by the U. S. Office of Standardization in MIL-STD-8A, and (4) by the American Standards Association in its proposed Y14-5 Standard on Dimensioning.

In this system, the theoretically true location of each cylindrical fea-

Figure 9—*The cylindrical tolerance zone shown here defines the area of permissible variation for hole center location as well as variation in squareness of hole axis.*

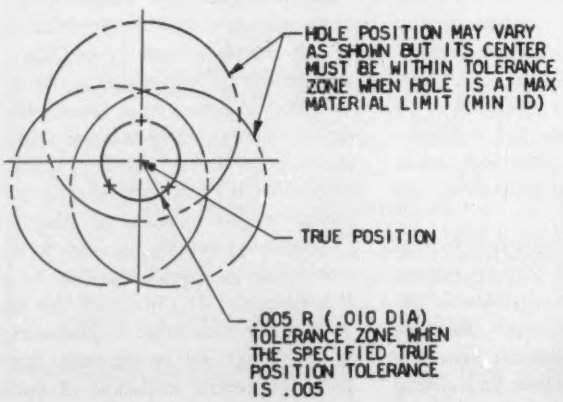
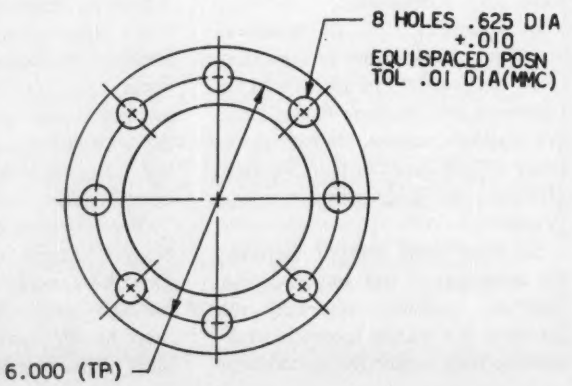


Figure 10—*This illustrates the British method of specifying that the positional tolerance applies to the (MMC) maximum metal condition of size.*



ture such as a hole is defined by the use of basic[1] (untoleranced) dimensions expressed in any suitable form of dimensioning, whether it be angular, rectangular, and so forth. On drawings which use a block of general tolerances, the word BASIC may be applied to each locating dimension as applicable; or this general note may be used: DIMENSIONS LOCATING TRUE POSITION ARE BASIC. This establishes the theoretically exact position for each hole. Then in the drawing note which specifies the number and size of holes, the phrase WITHIN .XXX OF TRUE POSITION is used. See Figs. 7 and 8.

In terms of the axis of the hole, this means that the axis at all sections along its length must fall within a cylindrical tolerance zone whose radius is equal to the true position tolerance and whose center is located at True Position as shown in Fig. 9. This tolerance zone also defines the limits within which variations in the squareness of the axis of the hole must be confined with respect to the surface.

Since the hole itself has a size tolerance which provides a high and low limit of size, it is necessary for the designer to define clearly on the drawing the condition of size to which the positional tolerance is applicable.

For many years on the aeronautical industry, where this method was widely used, there was an understanding established in workshops and inspection departments that the specified tolerance applied only to the maximum metal condition. This was based on the previously stated fact that the least favorable condition of assembly occurs when the mating features are at their maximum metal condition of size and the maximum variations permitted by the positional tolerance are present.

If this condition of assembly is controlled, it follows that the additional tolerance available as the mating parts approach minimum metal size will result in parts with the largest acceptable assembly clearances. This fact was covered on engineering drawings only by implication, and over the years the proper interpretation has been passed on by word of mouth.

This was satisfactory only when it was possible to contact the design engineering department when there were any misunderstandings or misinterpretations of this or other similar engineering requirements. However, with the increased use of subcontract operations, this reliance on workshop "know-how" became impractical and expensive. The British recognized this fact and covered this condition as outlined in Principle 1 by specifically stating it as part of drawing note with the use of the abbreviation for maximum metal condition, MMC. See Fig. 10.

Since this condition has been hitherto only implied in American practice, the joint SAE committee decided to specifically establish this condition by the use of the following general note on the drawing when required:

TRUE POSITION TOLERANCES SPECIFIED ARE FOR MAXIMUM MATERIAL CONDITION ONLY UNLESS OTHERWISE SPECIFIED.

From this it followed that where the actual size of the holes were other than at the maximum material condition, the design permitted an additional positional tolerance.

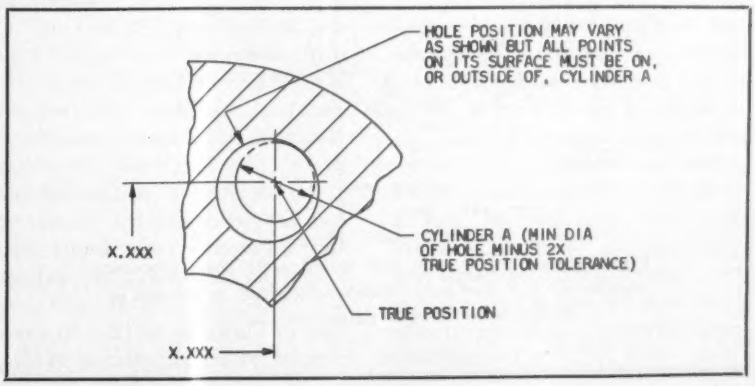
Since interchangeable manufacture concerns itself primarily with surfaces rather than imaginary centers or axes, a realistic interpretation of the application of true position dimensioning was developed. This states that in terms of the cylindrical surface of a feature, such as a hole, it means that all points on this surface shall be on, or outside of, a cylinder having a diameter equal to the minimum diameter of the hole minus twice the true position tolerance, with the center of the circle located at True Position. See Fig. 11.

Use of Position Gages

The important advantage in the use of the true position method is that it establishes a circular tolerance zone in contrast to the corresponding square tolerance zone provided by directly toleranced center distances. This circular tolerance zone permits full tolerance deviation in all directions. However, the square tolerance zone permits full tolerance only diagonally thru the corners of the square forming the zone. The circular tolerance zone also facilitates inspection because it corresponds to the control exercised by position gages.

In terms of gaging, the phrase WITHIN .XXX OF TRUE POSITION means that the holes in a part, such as shown in Fig. 7, are within the true position tolerance specified, if they receive the corresponding pins of a gage made to the requirements shown in Fig. 12. The inspection for the size of the holes is made independent of the inspection for position of the holes. It is interesting to note that for many years many of the automotive companies have been

Figure 11—*This is a realistic interpretation of true position dimensioning.*



[1] A dimension specified as BASIC is a theoretical value used to describe the exact size, shape or location of a feature. It is used as a basis from which permissible variations may be assigned.

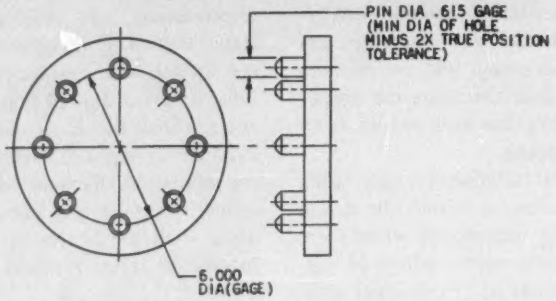


Figure 12—*Gage designed to check the holes of the part in Fig. 7 to see if they are within true position tolerance.*

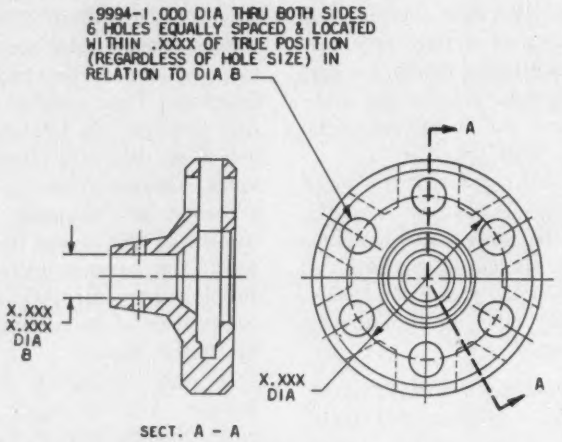


Figure 13—*In the case of this planetary pinion cage, each hole location has to be held within the specified positional tolerance, regardless of hole size.*

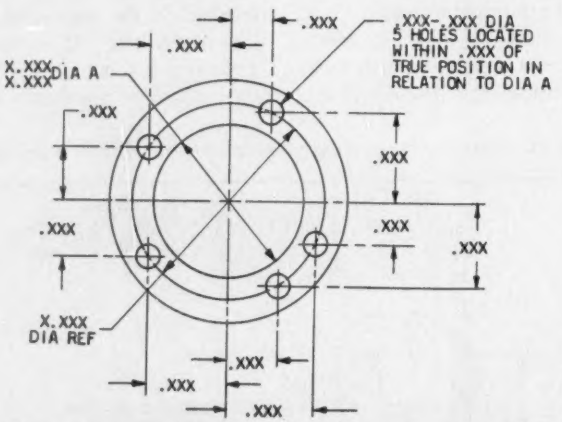


Figure 14—*Here is how you would apply true position tolerancing to a part with features that must be located in relation to an integral datum such as a pilot.*

defining requirements for groups of holes in mating parts by specifying in note form that the holes must freely admit a gage with .XXX diameter pins located on true position. The size of the gage pins was determined to produce the end result required.

However, this method was eliminated, since it was decided that SAE practice would be established on the basis of specifying only the desired end requirements for the engineering design. That allows maximum flexibility as to the method or process to be used by manufacturing and inspection in meeting these requirements.

Control of Position at any Condition of Size

The functional requirements of some designs demand that certain features be held to a uniform positional tolerance, regardless of whether or not the features are at the maximum metal limit. For instance, in the planetary pinion cage shown in Fig. 13, the six shaft holes may vary in size from 0.9994 diameter to 1.0000 diameter. Thus, it would be possible that in a given cage, the six individual hole diameters might measure: 0.9994, 0.9995, 0.9996, 0.9997, 0.9998, and 1.0000. However, to minimize the spacing errors of the pinions in the cage, each hole location should be maintained strictly within the specified positional tolerance, regardless of the size of the hole. That is, a hole at maximum material condition (0.9994 diameter) should be just as accurately located as a hole at minimum material condition (1.000 diameter).

When this restricted positional control is required, the proposed SAE Standard states that the phrase REGARDLESS OF HOLE SIZE shall be added to the true position note. This requires that inspection must be based on a method which will locate the actual center of each hole. It is evident that this type of control will be used in limited applications and requires more complicated and expensive positional gaging.

As was noted earlier, the British also recognized this type of situation and devised the method outlined in

Principle 2 to cover designs whose requirements dictated this type of control. However, in this case, the fact that the positional tolerance must be maintained regardless of the size of each applicable feature is specifically stated on the drawing per the proposed SAE Standard. It is only implied by interpretation in the British Standard.

True Position in Relation to Datum Surfaces

There are many designs for interchangeable assemblies that require parts which have groups of cylindrical or non-cylindrical features that must be located in relation to an integral datum such as a pilot. See Fig. 14. In these cases, the true position tolerance applies to the hole-to-hole relationship and also to the pilot-to-hole relationship. However, the true position tolerance specified must be maintained to the values specified only if both the pilot and the hole are at maximum material condition. Any hole not at its maximum material limit is permitted an increase of positional tolerance to the extent previouly described. Furthermore, if the pilot is not at its maximum material condition, a further increase of potential tolerance is permissible for all the holes in relation to the pilot, but not in relation to each other.

The important work that this Joint SAE Aeronautical and Automotive Drafting Committee has completed to date is gaining wide recognition in their respective industries. The American Standards Association has also recognized this work to the extent that it is being considered for use as the basis for the dimensioning section of its forthcoming national drafting standard. Any progress in the establishment of widely accepted practices for preparing drawings is of great importance not only to engineers, but to all users of drawings. It will help to eliminate the constant misunderstandings which plague engineering, manufacturing, and inspection personnel with respect to what is intended and required by the various call-outs on drawings.

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The New Era—Automation

Roger E. Gay, President, The Bristol Brass Corporation; President, the American Standards Association. Excerpted from a paper presented at the organization meeting of the Southern New England section of the Standards Engineers Society, Hartford, Conn, September 22, 1954.

We are in a new era of our economy. We are applying science to industry to an extent unequalled in history. We are carrying on industrial research and development on a team basis and are spending fantastic amounts of capital to do it. This has given us not only new materials and products but whole new industries — radar, electronics, nuclear energy, jet propulsion, synthetic textiles, plastics, and others.

More important even than new industries and new products is a new technique of production that is now well started in our economy. I refer to what is now known as "automation" — the method of production that is based on the concept of feedback control, or self-correction, through electronic devices and automatic control instruments.

Automation is an entirely new technology. It requires a wide variety of self-regulating and self-programming machines that can perform a sequence of logical operations. These machines must be able to choose according to built-in guides between several plans of action. They must correct errors that occur in the course of their operations.

This kind of production will produce advances in our productivity rate that will make the increases of the past fifty years look moderate. It will make possible the decentralization of industry. It will present management with problems of a complexity and size far beyond anything known today. Automation will compel the industrialist to take a new look at standards work. The waste of millions of dollars through lack of standardization or because of neglecting to comply with existing standards may be bearable in a pre-automation economy; but such waste is bound to be magnified a hundredfold under the far more intricate production processes of automation.

We at ASA have started some work in the field of automation. In April of this year, at the request of the ASME, we called a conference which voted to develop "terminology pertaining to automatic process control, feedback control, regulating and related systems not requiring human intervention as part of the regulating procedure."

All standardization effort begins, or should begin, with definition of terms. This conference set out in the right way to lay a solid groundwork in an industry that is of first importance to automation. But it is only a start.

Scores of standards are needed instead of a few. This is a relatively new industry, but we do not have to wait until it has come of age before we can write its standards. Even at this early stage, work can be pushed forward immediately. We can develop standard work heights, for instance. We can write standards for mountings of the machine of automation, for bases, beds, for columns and other sections of equipment. We can draw up standards for drive units and specifications for the application of electrical, hydraulic, lubrication, and pneumatic apparatus needed for production facilities.

If we don't do it now, we will have to do it later. Standards that are agreed on now can be adopted, used, and revised as the new science grows. If we write the standards in 1970 instead, in an attempt to correct today's ommissions and errors, we will be faced with the resistance of long, ingrown habit, with large capital investment in equipment, with strong conflicting interests, and with the need to wait for years until non-standard machines become obsolete.

More than 600,000 *small electrical appliances were repaired by Detroit Edison Co's Customers Service Division last year.*

Appliance Servicing and Standardization

by W. R. MILBY

SERVICE — A word of many different meanings to many different people. To the manufacturer, distributor, and dealer it is something that keeps popping up like a bad dream. It's something they realize they must at least pay lip service to, because in some remote way it seems to have some effect on sales.

To the utility, service is important because appliances in good operating condition mean more revenue.

To the consumer, who incidentally always seems to be at the end of the line, service has a much more personal meaning. Electrical living today is no longer a slogan—it is a reality; and the use of shavers, toasters, coffeemakers, dishwashers, garbage disposers, automatic washers, electric ranges, dryers, water heaters, and hundreds of other appliances is a part of our everyday life. To the consumer, good service is a necessity; unfortunately, it is not always to be had.

While it seems at first thought that these three views are widely divergent, they do have this in common — there can be neither sales, service, nor customer satisfaction without the cooperation of all three groups. The manufacturer must take into account the consumers' problems in using his product and in keeping it in good operating condition. He can also learn much from the service organizations that will improve his product.

On the other hand, the consumer must understand the function, proper care, and use of his appliances. Somewhere in between, the utility must coordinate and correlate the problems of both the consumer and the manufacturer. The problems are mutual, and none of us are in a position to point a finger at other segments of the industry.

I have not intended to, and I hope I have not, created the impression that the manufacturers have no interest at all in service. The manufacturer is in business to build and sell appliances; service is necessarily a secondary consideration. From our own experience we have found the manufacturers to be very cooperative in solving service problems and in making changes to correct deficiencies in their product.

Major domestic appliances, as well as traffic appliances, today require relatively little service, but when we consider the huge volume sold and in use, even this little bit of service adds up to a big problem and to a big business. Our investment in stock for traffic appliances alone is $87,000.

We service most traffic appliances, as well as ranges, dryers, and water heaters. Last year we repaired over 600,000 small appliances and to make these repairs we carried 15,000 items in stock.

Irons account for 42.5 percent of our total repairs. With practically 100 percent saturation of irons, this means that 31 percent of the irons in use in the metropolitan area of Detroit need repairing each year—almost one in every three.

Steam iron repairs are about 16 percent of the total iron repairs. Here, also, we are repairing one out of every three steam irons in use.

There are some service problems in connection with steam irons. It is impossible to get some irons apart without breaking off and drilling out screws. In the case of this appliance perhaps the manufacturers should

The Author: *Mr Milby is Assistant Superintendent, Customers Service Division, The Detroit Edison Company, Detroit, Michigan.* *This paper was presented before the Fifth Annual Appliance Technical Conference of the American Institute of Electrical Engineers, Chicago, May 18, 1954.*

recognize that the consumer in most cases will not follow instructions and use distilled water; or those manufacturers who claim distilled water is not necessary should include in their performance test standard the ability to disassemble the iron after a reasonable period of operation.

There are three other appliances that, along with irons, make up the bulk of our traffic-appliance repair business. We repaired 72,000 toasters, 59,000 clocks, and 37,000 coffeemakers in 1953. The saturation in our area is about 90 percent on toasters, 87.5 percent on clocks, and 32 percent on coffeemakers—so that one in every 7.5 toasters, one in every nine clocks, and one in every five coffeemakers required some type of repair in 1953.

Just as an indication of how the appliance repair business has grown —ten years ago in 1944 we repaired 245,000 small appliances and in 1949 we repaired 390,000 as compared with over 600,000 last year. With this volume, even the little service problems grow big.

Major Appliances

Let's take a look now at some of the service problems in connection with major appliances. The service record for ranges, dryers, water heaters, and automatic washers is excellent. There are, however, a few points which we might consider that would make the record even better.

We are all interested in service at the lowest possible cost.

Suppose we start with laundry equipment. The automatic washer, together with the clothes dryer, make the greatest labor-saving combination found in the home. These are not luxury items found only in homes in the upper income bracket. There would be no volume production and sale of these appliances if they weren't bought by the middle and low income groups.

The sales people have done an excellent job of making it easy to buy an automatic washer with only a few dollars down and the balance on easy terms. But when a repair costs $50, $60, or $75, and the terms are cash, we may find that middle and low income people cannot afford to own this essential piece of equipment. They can afford to buy it, but they cannot afford to keep it in repair.

Why are service costs so high? Sure, labor rates are high and the appliances are complex, but our job —the job of the manufacturer, the design engineer, and the utility companies—is to design and build machines that require a minimum of service and which, when service is required, can be repaired without dismantling the machine.

A case in point involves a particular make of washer which must be half torn down in order to replace a belt. Another cause of high service costs is the necessity, in many cases, of replacing an entire transmission on an automatic washer at a parts cost to the customer of $50 to $75 when the replacement of only a 15-cent spring would effect a complete repair. In this particular case, the labor involved in opening up the transmission and replacing the spring must be taken into consideration, but it may be possible to design the unit so that vulnerable parts, such as this spring, can be readily replaced.

Lint accumulates around the bearings on some dryers, but no provision is made for cleaning the lint out. When the lint finally accumulates to the point where the drum stops, the machine must be completely torn down just to clean out the lint.

This is not a criticism of any one manufacturer; it is merely an example of some of the places to which we can look to improve the product and the service record.

Appearance and cost of manufacture must always be taken into account. We do not want to solve our service problems by building appliances that have no sales appeal or appliances which must sell at a prohibitive price. There is a middle ground that we are trying to find between sales and service. Neither can exist without the other and each poses certain problems to the other.

Standardization

Where does standardization fit in the service picture? There are performance standards for a few appliances and there are many more being prepared. The manufacturers make sure of high quality in their own product through quality control in their plants. But no one to my knowledge has proposed a Service Standard.

What might such a standard encompass?

1. A minimum number of standard size screws, nuts, and bolts should be used in assembling the appliance.
2. Rivets and press fits should not be used to mount parts which must be replaced nor to assemble the body or case of the appliance.
3. Component parts should be easily accessible and easy to replace.
4. Small parts and sub-assemblies should be replaceable, instead of making it necessary to replace larger, more costly assemblies.
5. Major appliances, such as ranges, dryers, washers, etc, should be designed to permit most service operations to be performed from the front so that the appliance does not have to be moved out from the wall.

These are very broad considerations and if incorporated in a Service Standard would necessarily be applied in more detail to the particular appliance covered in the standard.

There are many other items which probably occur to many of you.

Such a standard should receive the careful attention of the entire appliance industry. It could be a very useful document to manufacturers and dealers alike. It could become part of a certification program similar to the certified lamp program. The dealers might find it a strong selling tool.

Let's review these points and see how valid they are.

First—The use of standard size screws, nuts, and bolts in assembling the appliance. In our appliance repair shop we carry 591 different type nuts, screws, rivets, and washers just for the repair of traffic appliances. We can live with this sort of a situation in a shop, but it is not physically or economically possible to provide fieldmen with such a stock. Our men are pretty good mechanics and do a good job of parts substitution and improvise in many cases to complete a repair. It would save a lot of manhours, however, if a small stock of nuts and bolts were all that were necessary to make repairs to any appliance.

Second — Rivets and press fits should not be used to mount parts which must be serviced. This perhaps is part of the requirement for easy replacement of parts, but this type of assembly is common enough to warrant listing it as a separate item. A device put together with rivets and clips is not readily serviced. Rivets must be drilled out and clips often break off.

Third—Component parts should be easily accessible and easy to replace. Some ranges have been designed so that it is necessary to remove the oven lining in order to replace the oven unit. On one range it is necessary to raise the table top to replace a pilot light. Many ranges must be pulled out from the wall to replace a pilot light or a switch.

The replacement of bearings on clothes dryers should be a relatively easy one-man job. However, in many cases two men are required and in some cases it has been necessary to replace the entire drum and shaft assembly because it was impossible to remove the bearing assembly.

The replacement of oven element terminals on a range would seem to be a simple operation, but on some ranges it is a difficult task for one man because of the type of mounting. The serviceman needs one hand inside the oven and one hand on the back of the range. Our servicemen's arms are not that long.

Fourth — Small parts and subassemblies should be replaceable rather than requiring replacement of larger, more costly assemblies. Thermostat and timer assemblies on toasters, for instance, which might cost, let us say, $5 to replace, might be repaired and made operative by merely replacing small parts, such as insulators, contact points, or a spring at a parts cost of only 10 cents to 50 cents. There are many examples of this, particularly in the small appliance field. The practice has probably been justified on the basis that the average repairman or repair shop has not sufficient training or know-how to make the partial replacement. However, the service business has grown beyond the handyman's stage and we must assume that competent men are making many of the repairs.

Fifth—The design and construction of the appliance to be such that most service operations can be performed from the front on major appliances, such as ranges, dryers, and washers. Moving any one of these appliances out from the wall requires additional manhours and involves possibility of injury to the serviceman. Several of our men have incurred back injuries lifting ranges out from the wall. Sliding the range over the kitchen linoleum floor often cuts or scratches the linoleum, resulting in a damage claim. After the repair has been completed, the appliance, and this applies to ranges, dryers and washers, must be carefully checked to make sure it is level.

With the growing trend toward one-floor ranch homes with no basement, there are more and more counter-type installations of washers and dryers with the range squeezed into its particular niche. This means that it will be even more important that all but the most major repairs should be possible from the front of the appliance.

There is much that can be done in the way of standardization in the appliance field — standardization that would not be included in a Service Standard, but at the same time would do much to lower service costs and possibly manufacturing costs as well. The greatest potential here lies in the major appliance field, particularly in connection with ranges, dryers, and water heaters.

I don't mean that we should discontinue new models, new ideas, or new gadgets. Standardization should never limit ingenuity in design or radical departures to new methods or materials. The appliance industry, like the automobile manufacturers, has developed to a very high degree that sales stimulant—new models.

We stock parts for some 37 makes of ranges, representing about 1400 different models. We also stock parts for 21 makes of dryers, totalling 95 different models. There are almost 4000 different stock items required to service the many different models of these two appliances.

Here, there are many places where some degree of standardization could be established without interfering with progress and improvement in design. As an example, switches controlling surface units on ranges could be standardized by establishing a maximum over-all size, a standard size and length of shaft, and a uniform mounting method.

Some seven or eight years ago we looked at the possibility of using some universal type of replacement switch. We ran into a multiplicity of mountings, different sizes and types of shafts, different arrangements for connecting to the bus feeder, and the problem of mounting space. We finally found that by using 9 switch bodies, 25 shafts, 8 mounting fittings, and 4 knobs, we could assemble enough different combinations to replace 126 types of switches we formerly stocked.

It didn't take the manufacturers long to catch up to us, however. Many ranges today are equipped with push-button switches or switches having a much smaller body and requiring less space. As a result we are not able to assemble combina-

Irons, toasters, clocks, *and coffeemakers led in number of electrical appliances repaired by Detroit Edison last year.*

Detroit Edison

tions that will fit many of the ranges being built today, but it is still a good solution on the older models. We don't quarrel with these advancements and improvements, but we haven't given up our efforts to find and use as many universal replacement parts as possible.

Some uniformity in surface units could be achieved by setting a standard for the size of the opening in the table top, as well as for the type of mounting flange in the opening. We have had a good deal of success in the use of a universal type of replacement surface unit, but it requires the stocking of 39 adapter rings to fit the many openings.

Another item that could stand a lot of standardizing is pilot lights. And, here it seems as though the lamp manufacturers could help.

We replace 60,000 pilot light bulbs each year. That represents a lot of manhours to make a relatively minor repair or let's say to install a low cost part. If only one trip were required for each call it wouldn't be too bad, but each fieldman can't carry all 22 different varieties of pilot lights along with table top lamps and oven bulbs which we stock and extra trips are all too frequent. Incidentally, some standardization here might also result in the use of pilot lights better designed for this particular application which might mean longer life and less replacements.

There are many more possibilities for standardization on ranges: table top lamps, starters for fluorescent lights, switches, oven bulbs, etc.

Let's take a quick look at the dryer problem. As I mentioned a moment ago, we are servicing 21 makes, totalling 95 models of clothes dryers, and we carry 434 different stock items for this appliance alone. Standardization which would permit the use of universal type heating units and timers is a little difficult without restricting the design and operating characteristics of the dryer. It might be possible, however, to standardize on the type of mounting of the timer, shaft size, etc, and to specify the maximum size of the heating unit and general method of mounting.

Standards for motors could be established, however, which would make mountings uniform as well as the shaft and electrical circuit connections. Last year we replaced 970 motors on dryers and it required 23 different types. One manufacturer used 1/6, 1/4 and 1/3 horsepower motors on the same model, all of which had different mountings.

Now, just a brief word about water heaters. This is one appliance that lends itself very well to standardization. All immersion units should have a standard spacing for bolt holes. At the present time there are two generally used spacings, but there is no official standard. A uniform mounting method could be established for all surface mounted thermostats and another for all immersion thermostats. A standard could be arrived at which would provide for the installation of a temperature relief valve. More and more communities are making the use of a temperature relief valve mandatory. While the water heater is generally thought of as a simple device, we stock 153 different parts for 38 makes and we have gone a long way toward stocking elements and thermostats which have universal application to many water heaters.

When it is necessary for the manufacturer to substitute replacement parts, the part or the package should indicate this substitution and adequate instructions should accompany the part.

Another problem is that of getting service information on new appliances. The information generally lags the introduction of the new model by 60 to 90 days and often parts are not available for new models. Perhaps this would be a good point to include in a Service Standard.

I have been very frank in discussing some of the service problems which we encounter. The opinions and ideas which I have expressed are probably colored by our particular type of service operation. We may look at some of the problems differently, but if this discussion today has stimulated some new thinking on appliance servicing, I am sure that with the coperation we have always received from the manufacturers we will solve most of our problems.

GAILLARD SEMINAR

January 1955

The next five-day private Gaillard Seminar on Industrial Standardization will be held from January 24 through 28, 1955, in the Engineering Societies Building, 29 West 39 Street, New York City. Leader of the seminar is Dr John Gaillard, management counsel, formerly a member of the ASA staff and lecturer at Columbia University.

The January, 1955, seminar will consist of ten conferences, two being held each day, Monday through Friday, one in the morning (9:30 to 12:00) and one in the afternoon (1:30 to 4:00). Basic analysis of standardization applicable to any industrial activity will lead up to organization and operation of company standardization, and principles and practice of effective specification writing. Stress will be laid on use of standards in planning for the future and smooth revision of standards to keep up with continuous progress. Round-table discussion of each subject will follow its presentation by Dr Gaillard, thus giving each conferee an opportunity to bring up problems arising from his own work.

The Gaillard Seminars, started in 1947 by request from industry for guidance in this field, have so far been attended by 253 men representing 141 organizations. Among these are American and Canadian companies; trade associations; the U.S. Army, Navy, and Air Force; National Bureau of Standards; the ASA and four foreign national standards bodies; American Society of Mechanical Engineers; Mellon Institute; Massachusetts Institute of Technology; and the Universities of California and Illinois.

For further details and registration, write to Dr John Gaillard, 400 West 118 St., New York 27, N. Y. Places at the seminar may be reserved in advance.

Standards Engineers Hold Third Annual Meeting

American taxpayers were saved $65,000,000 during the first six months of 1954 due to use of standards by the military services. This statement was made by R. V. Vittucci, Standardization Planning Engineer of the U.S. Navy Department's Bureau of Ships, at the Third Annual Meeting of the Standards Engineers Society. The meeting was held October 1 and 2 at Haddon Hall, Atlantic City, N. J.

By using standard parts in accordance with industrial practice wherever possible, Mr Vittucci said, 45,000 unnecessary items were eliminated from the Supply System of the Defense Department from January through June, 1954. This resulted in a saving of 120,000 cubic feet of storage space and 400,000 manhours.

Mr Vittucci called attention to new regulations issued last month that will increase Government economies by encouraging greater cooperation between Government and industry. These regulations make it possible for Government representatives to participate with industry representatives in developing standards used by both industry and Government, thus bringing industry and Government practices more nearly in line with each other.

Other speakers at the session on Integration of Government and Industry Standards were S. H. Watson, Standardizing Division, Radio Corporation of America, and R. J. Painter, Executive Secretary, American Society for Testing Materials.

Mr Watson reported that a standard drafting practice that will meet the requirements of American industry and is of special interest to the military organizations is now near completion by a committee of the American Standards Association. This work is also well-integrated with Canadian and British practice, he said.

In his paper, which was read by J. S. Pettibone, of The American Society for Testing Materials, Mr Painter called attention to the standards covering petroleum products as an example of integration of government and industry standards. Of the 126 methods of test given in Government standard VVL791E, 72 are identical with standards issued by the American Society for Testing Materials, he declared. ASTM Committee D-2 has a special liaison committee which devotes considerable time and effort in assisting to keep Government standards in line with industrial trends. He suggested that machinery be set up so that Federal standards can be kept in step with ASTM standards as they are revised.

International interchangeability is essential for improvement of world markets, Howard Coonley, Vice-President, Research Corporation, New York, declared at the Society's afternoon session on International Standardization and American Industry. "World peace cannot be attained on a sentimental basis or by hoping for it," he said. "World peace is only possible if you can find a means of interchanging goods and services on a basis profitable to all. The work of members of this organization is a big step toward that goal."

Mr Coonley's emphasis on the importance of standards in world trade was confirmed by Vice Admiral G. F. Hussey, Jr, (USN, Ret), Managing Director of the American Standards Association. He declared that, lacking international standards, American industry should work to bring about greater acceptance of American Standards in countries where standardization is not yet well advanced. This is necessary, he said, if U.S. goods are to hold their own in these markets.

S. P. Kaidanovsky, Technical Director of the Management and Technical Services, New York, was moderator at these sessions.

Money value is the key to management's acceptance of standards, H. Thomas Hallowell, Jr, President of the Standard Pressed Steel Company, declared. He spoke on the Place of Standardization in Management. From his own experience he

The Honorable Herbert Hoover *receives award from Wm L. Healy, General Electric Company, Philadelphia, president of the Standards Engineers Society. Looking on is Madhu S. Gokhale, RCA Victor Division, vice-president of the Society.*

showed how profits can be increased by eliminating the cost of making "specials." In times of depression or recession, standards consciousness keeps men at work and provides economies that help break the effect of low production, he declared. A standards conscious company can complete many standards projects and studies in slack times that have had to be postponed in boom times, he said.

The Saturday morning session heard Dr M. A. Williamson, Manager, Research Division, Burroughs Corporation, describe the methods of setting up and operating a materials department. Skill in public relations is the most important tool for the head of the Materials Department, he said, since a Materials Department is called upon to provide information in a hurry that in many cases is not readily available.

The Society heard reports on organization of sections in Washington, D.C. and Hartford, Connecticut, in addition to sections already operating in Philadelphia, New York and Binghampton.

W. L. Healy, General Electric Company, Philadelphia, is president of the Society.

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AWARDS PRESENTED

Former President Herbert Hoover, Vice Admiral G. F. Hussey, Jr, and the late Dr Paul Gough Agnew have been selected by the Standards Engineers Society as the first recipients of its highest award—the status of Fellow in the Society. The posthumous award to Dr Agnew was that of Honorary Fellow. The awards were announced at the Society's Third Annual Meeting, held at Haddon Hall, Atlantic City, N. J., October 1 and 2.

Unable to be present because of engagements connected with his Government reorganization work, Mr Hoover accepted the award at a presentation ceremony September 28 in New York. He wrote the Society: "I regret that my dates on reorganization of the Government prevent me from being present in person at your meeting. However, I wish to be present in spirit for three reasons. First, standards must be the base of our whole productive life. Second, I have had to deal with these problems in some aspect ever since I went to college. Third, once an engineer always an engineer. And finally, I am greatly indebted to the Society for the honor you have conferred upon me. I wish you continued success in a work of great public importance."

Vice Admiral G. F. Hussey, Jr, *Managing Director of the American Standards Association, with Stan Zwerling, Armed Services Electro-Standards Agency, chairman of the Standards Engineers Society's Awards Committee, after Admiral Hussey received Society's Award.*

The Society's citation reads:

"Statesman, public leader, and great engineer, he has distinguished himself in his profession, in the eyes of his country, and before the world as protagonist of the principles on which standards operate —efficient production and elimination of waste. In his early career as Secretary of Commerce he recognized the significance to the country's economy of a movement then in its infancy, and stimulated its development by creating the Division of Simplified Practice. The work he then started never lost his support. As thirtieth President of the United States, he continued to further the movement. As Chairman of the committee that bears his name, already noted for its wise and statesmanlike proposals for efficient, economical government reorganization, he emphasized the importance of standards in achieving the desired efficiency and economy. He stands before the world as a symbol of integrity and efficiency and as a pioneer Standards Engineer."

The citation to Admiral Hussey called attention to his encouragement of cooperation between Government and industry, both nationally and internationally. It reads:

"As Chief of the Navy's Bureau of Ordnance during World War II, he encouraged cooperation between industry and government in development of standards for greater efficiency in production. As Managing Director of the American Standards Association, he is bringing about greater coordination of standards both nationwide and internationally. Under his leadership, more active participation of companies, associations, and technical societies in voluntary standardization, both national and international, has been encouraged and advanced. His integrity and the esteem in which he is held by all who know him have brought him honor — as President of the Naval Academy's Alumni Association and as President and National Director of the New York Post of the American Ordnance Association. His ability to get things done has been of benefit to the standards movement and to the organizations with which he is concerned."

The citation to Dr Agnew mentioned his contributions to the philosophy of standardization and his early work in developing the standards movement:

"Scientist, writer, and statesman in the standardization field, he was untiring in his efforts on behalf of voluntary standards. His vision and work helped build an effective association for coordination of standards on a nationwide level, and he personally played an important role in developing an international organization for better understanding and greater uniformity of practice between nations. He saw in these organizations the machinery for solution of controversies and for smoothing the relations of manufacturer, consumer, and government in production and exchange of goods. He bent all his efforts to making these organizations more effective. His philosophy as expressed in his published articles and papers stands as a reference and guide for standards engineers of today and for those of the future."

Armed Forces Courses Open to Industry

Members of the American Standards Association are invited to take advantage of the opportunities offered by the Industrial College of the Armed Forces to become better acquainted with current thinking on the national economy and national security. The College operates an Extension Courses Division consisting of two branches—the Civilian-Reserve Instruction Branch and the Correspondence Study Branch. Both of these courses are open to ASA members. Representatives of some member organizations have already participated in them.

The Industrial College is the only school of its kind in the world. While it is a military school, its field of study is the civil economy and its operation in both peace and war. Its faculty consists of civil instructors as well as officers from all the military services. Its mission is to prepare senior military officers and selected civilians for top level command and staff assignments. It is purely an educational institution and does no planning, policy making, or operating for any other governmental agency.

The College conducts three courses:—the Resident Course, the Correspondence Study Course, and the National Resources Conferences.

The resident course, conducted at Fort McNair, Washington, D.C., runs for ten months each year, starting in late August. Its students number 135 each year. They are Federal Government employees, both civilians from Federal agencies, such as the Departments of State, Commerce, Defense, Labor, the General Services Administration, and the Atomic Energy Commission, and also senior officers from the Army, Navy, the Air Force, and the Marine Corps. The course on Economic Mobilization is broad and on the graduate level. It includes a study of economics, organizations, controls which make for economic stabilization, and the Federal budget and its effect on the country's economy.

The Civilian-Reserve Instruction Branch conducts National Resources Conferences (old title "Field Economic Mobilization Course") in 16 different cities throughout the United States annually. During each conference, of two weeks duration, an objective study is conducted in broad terms of the economy and resources of the United States and the free world, and the limitations imposed thereby on national aims and objectives. The economies of the other nations of the free world and of the Iron Curtain countries are also considered. The facts and factors considered by the conferences are of current importance and are those considered necessary for an intelligent grasp of the very complex and difficult problems facing the country today.

The presentations consist of lectures followed by discussions. Instruction is given by a six-man faculty team to reserve officers of the Army, Navy, Air Force, Marine Corps, and National Guard as part of their education. Civilian leaders in the fields of industry, education, science, labor, and civic life are invited to participate along with these officers.

Since the founding of this educational activity in January 1948, instruction has been given over 90 times in industrial centers throughout the country, with more than 24,000 individuals participating.

The schedule for 1954-1955 is as follows:

BLUE TEAM

City	*Dates*
Great Falls, Mont.	27 Sept—8 Oct 54
Albuquerque, N. Mex.	6 Dec—17 Dec 54
Sacramento, Calif.	24 Jan—4 Feb 55
Tampa, Fla.	28 Feb—11 Mar 55
Toledo, Ohio	28 Mar—8 Apr 55
Philadelphia, Pa.	18 Apr—29 Apr 55
Austin, Tex.	16 May—27 May 55
Worcester, Mass.	6 Jun—17 Jun 55

GREY TEAM

Milwaukee, Wis.	20 Sept—1 Oct 54
Chattanooga, Tenn.	25 Oct—5 Nov 54
Durham, N. C.	29 Nov—10 Dec 54
Little Rock, Ark.	10 Jan—21 Jan 55
South Bend, Ind.	7 Feb—18 Feb 55
Spokane, Wash.	14 Mar—25 Mar 55
Kansas City, Mo.	18 Apr—29 Apr 55
New York, N. Y.	16 May—27 May 55

The Correspondence Study Course was started in September 1950, to meet the demand for more extended and detailed instruction in the field of economic coordination than that presented in the National Resources Conferences.

This course, designed to be completed in approximately one year, is conducted by the Correspondence Study Branch of the Industrial College of the Armed Forces. The College has prepared and published a text, "Emergency Management of the National Economy," together with other study materials paralleling those used in the resident course. There are self-administered examinations at the end of each of the five units of the course. Some 2600 students are now enrolled, of whom 800 are civilians.

Applications or inquiries on either ther of these courses should be addressed to the Commandant, Industrial College of the Armed Forces, Fort Lesley J. McNair, Washington 25, D.C. For information about the National Resources Conferences, address Attention: CRIB; for correspondence course, Attention: Correspondence Study Branch.

Quality Control Featured

Principal feature of the May 1954 issue of *Standards Engineering* is an article on "Standardization and Its Effect on a Quality Control Program" by Michael O'Hanlan. *Standards Engineering* is published by the Standards Engineers Society. Mr O'Hanlan delivered his talk on quality control before the Philadelphia Section of the Society, March 30, 1954.

A new series of personal comment, "The Standards Column" by John Gaillard, started as a regular feature with this issue of *Standards Engineering*.

New GSA Procedures for the Development and Use of Federal Specifications, Standards, and Qualified Products Lists

By S. P. Kaidanovsky

EFFECTIVE July 6, 1954, the General Services Administration issued regulations whereby the "assigned agency" method became the official system of the Federal Government for the development of Federal Specifications, Standards, and Qualified Products Lists.

The regulations establish, for the first time, a Government-wide statement of policy and procedures for the development and use of the above procurement documents. Accelerated production of specifications and standards will result from the adoption of a more effective method, from collaboration with GSA of Federal agencies having specialized knowledge and technical facilities, and from broader participation of industry and technical and professional societies in Government standards work.

Since the inauguration of Federal Specifications activities in 1921, the development of Federal Specifications and Federal Standards had been performed through the "technical committee" system, under the Federal Specifications Board which was abolished in 1952. The "technical committee" system has been progressively discontinued during the past two years and replaced by the "assigned agency" method.

The change in the system for developing specifications and standards was brought about by the increasing use of Federal Specifications and standards, by requirements for more frequent revision of specifications to keep abreast of new technological developments, and by the importance of streamlining operations for rapid production of specifications and standards meeting the essential requirements of the Federal Government and reflecting the most recent developments in the technology of this country.

Under the assigned agency method, the General Services Administration may assign the continuing responsibility for the development and maintenance of a Federal Specification, a Federal Standard, or a Federal Qualified Products List to a Federal agency with its consent. The GSA may also assign such responsibility to one of its Services.

In assigning responsibility for development of specifications and standards and their coordination with other Federal agencies and industry, GSA takes into account the technical competence of the assigned agency's staff, procurement needs of the agency for the item to be covered by the specification, and the feasibility of assigning related groups of specifications and standards to that agency.

Development and Preparation of Federal Specifications

Definition of Specifications.—The following definitions of Specifications — Federal, Interim Federal, and Departmental, including Military (MIL)—have been established by the GSA:

"*Specification.* A clear and accurate description of the technical requirements for a material, a product, or service, including the procedure by which it will be determined that the requirements have been met.

"1. *Federal.* A specification covering those materials, products, or services used by two or more Federal agencies (at least one of which is a civil agency), or new items of potential general application, promulgated by the Administration (GSA) and mandatory for use by all Federal agencies.

"2. *Interim Federal.* A specification intended for final processing as either a new or revised Federal Specification, issued in interim form for mandatory use by the agencies specified in the preamble to the specification, but which may be used by other agencies; or issued to cover immediate procurement needs of one agency, but which may be of interest to another Federal agency.

"3. *Departmental.* A specification developed and prepared by, and of interest primarily to, a particular Federal agency, but which may be used in procurement by other Federal agencies. This definition applies to MIL Specifications, further defined as:

Military (MIL). A specification issued by the Department of Defense, used solely or predominantly by and mandatory on military activities.

Integration of Government and Industry Specifications. — Among the basic GSA objectives in the development of Federal and Interim Federal Specifications are:

(*a*) Encouragement of broader industry participation in the Government Supply program.

(*b*) Integration of Government and industry specifications and standards.

The following requirements contribute to such participation and integration:

1. Utilization of nationally recognized industry, technical society, and other commercial specifications and standards and their adoption to the maximum extent practicable.

2. Adoption to the maximum extent, consistent with Government needs, of specification requirements which can be met by products of standard commercial construction, manufactured by business enterprises for general commercial use.

Mr Kaidanovsky is Technical Director of the Management and Technical Services, New York. He was formerly chairman, Federal Interdepartmental Standards Council; technical consultant, Federal Specifications Board, and editor, Standards World.

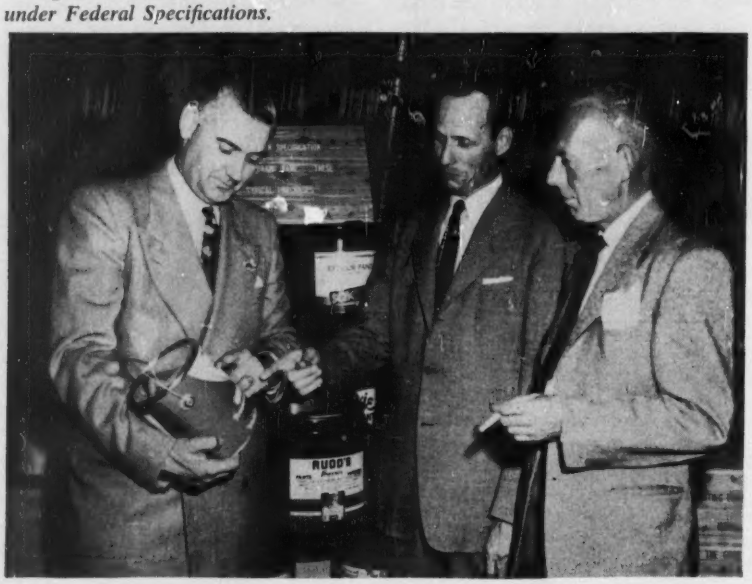
3. Use, wherever practicable, of functional or performance requirements rather than design, construction, or compositional requirements.

Preparation of a Federal or Interim Federal Specification. — Following acceptance by a Federal agency of responsibility for the development of a Federal or Interim Federal Specification, the agency prepares and processes the assigned specifications in accordance with the Flow Chart for Development of Federal and Interim Federal Specifications on page 335, and the Outline of Form for the Preparation of Federal and Interim Federal Specifications, recently revised, which are included in the Appendix to the Regulation.

Conversion of a Departmental Specification into a Federal or Interim Federal Specification. — The procedure for the development, coordination, review, and issuance of a Federal or Interim Federal Specification also applies to the conversion of a departmental specification into a Federal or Interim Federal Specification. The conversion of a departmental specification takes place only when such specification is of use to more than one Federal agency (one, a civil agency).

Entrance to a GSA Business Service Center *showing display of some of the things GSA buys under Federal Specifications.*

Group of GSA officials *inspecting cans of paint delivered to GSA and purchased under Federal Specifications.*



Consultation with Federal Agencies.—The assigned agency consults with other Federal agencies to assure that a specification is adequate for use by agencies for which it is mandatory.

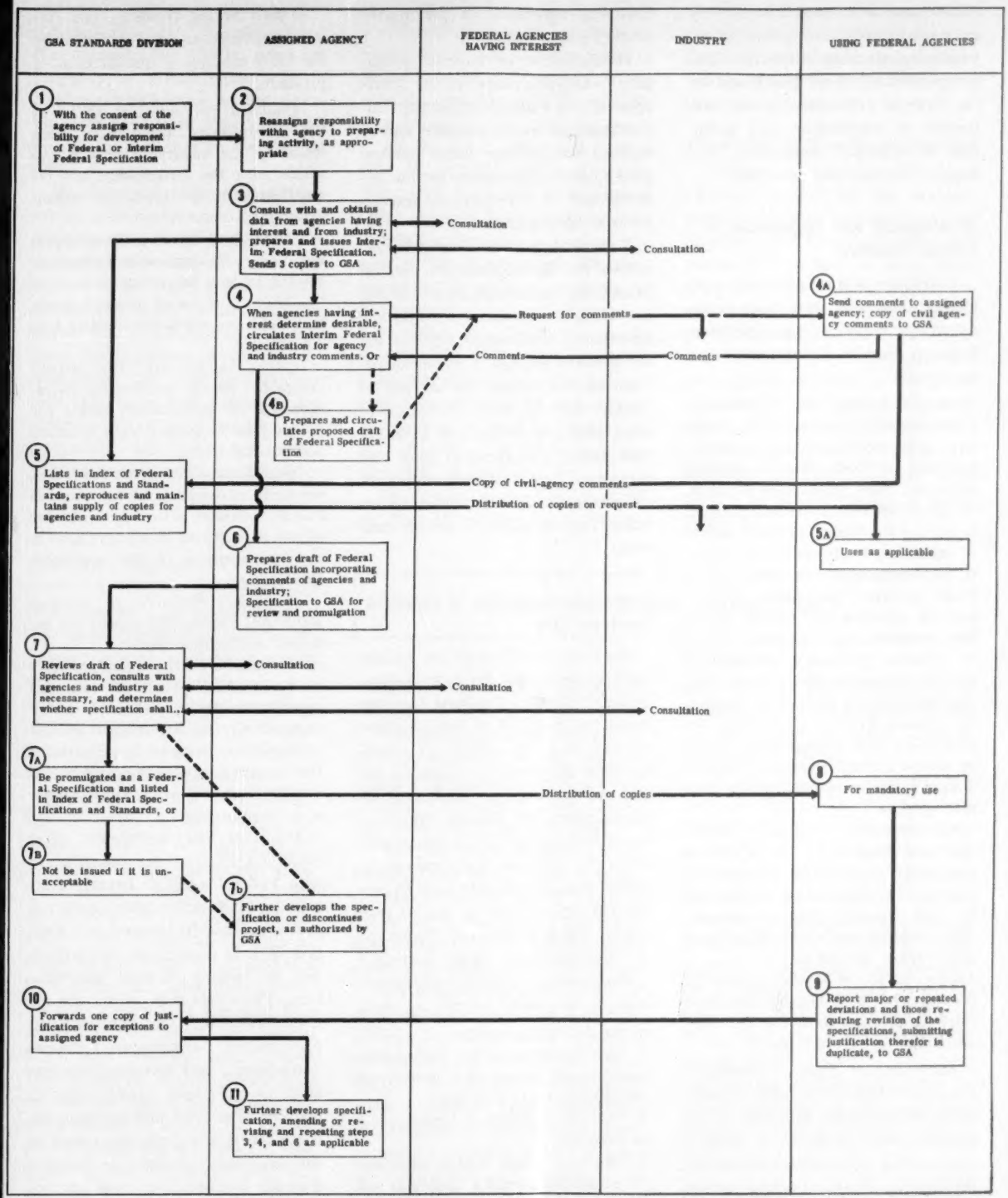
Consultation with Industry.—The GSA procedures provide for consultation by the assigned agency of industry representatives or groups, assuring fair representation of the industry affected and others properly concerned. By Administrative Order No. 153, dated December 18, 1953, the GSA prescribes policies and procedures for the establishment and conduct of technical committees and technical conferences which provide for the participation of technicians from industry, technical societies, and trade associations, consistent with criteria established by the Department of Justice to insure against violation of antitrust laws. The GSA Administrative Order was described on pages 121-22, April, 1954 issue of THE MAGAZINE OF STANDARDS under the heading "GSA Regulation Paves Way to Broader Industry Participation in the Development of Federal Specifications and Standards."

GSA Standardization Program

In developing its standardization program, the main objectives of the General Services Administration are to achieve the greatest savings to the Government and increase efficiency in supply operations. For this purpose the GSA is concentrating its standardization efforts on common use items having large purchase volume, and which are of importance to supply programs of the Federal agencies. Some of the results of the GSA standardization program have been described on pages 122-23, April 1954 issue of THE MAGAZINE OF STANDARDS, under the heading "Savings Through Federal Standards." Since then 16 Federal Standards have been promulgated, resulting in similar reductions in supply items.

Among other objectives of the GSA's standardization program are uniformity of practices and proc-

(*Continued on page 336*)


GSA STANDARDS DIVISION
ASSIGNED AGENCY
FEDERAL AGENCIES HAVING INTEREST
INDUSTRY
USING FEDERAL AGENCIES
1 With the consent of the agency assigns responsibility for development of Federal or Interim Federal Specification
2 Reassigns responsibility within agency to preparing activity, as appropriate
3 Consults with and obtains data from agencies having interest and from industry; prepares and issues Interim Federal Specification. Sends 3 copies to GSA
Consultation
Consultation
4 When agencies having interest determine desirable, circulates Interim Federal Specification for agency and industry comments. Or
Request for comments
4A Send comments to assigned agency; copy of civil agency comments to GSA
Comments
Comments
4B Prepares and circulates proposed draft of Federal Specification
5 Lists in Index of Federal Specifications and Standards, reproduces and maintains supply of copies for agencies and industry
Copy of civil-agency comments
Distribution of copies on request
5A Uses as applicable
6 Prepares draft of Federal Specification incorporating comments of agencies and industry; Specification to GSA for review and promulgation
7 Reviews draft of Federal Specification, consults with agencies and industry as necessary, and determines whether specification shall..
Consultation
Consultation
Consultation
7A Be promulgated as a Federal Specification and listed in Index of Federal Specifications and Standards, or
Distribution of copies
8 For mandatory use
7B Not be issued if it is unacceptable
7b Further develops the specification or discontinues project, as authorized by GSA
9 Report major or repeated deviations and those requiring revision of the specifications, submitting justification therefor in duplicate, to GSA
10 Forwards one copy of justification for exceptions to assigned agency
11 Further develops specification, amending or revising and repeating steps 3, 4, and 6 as applicable

Flow Chart for Development of Federal and Interim Federal Specifications

(*Continued from page 334*)
esses of manufacture, preservation, packaging, packing, inspection, and acceptance of items purchased by the Federal Government; and uniformity in terminology and definition of technical, engineering, and supply practices and processes.

Development and Preparation of Federal Standards

Definition of Standards.—The following definitions have been established by the GSA for standards, Federal, Interim Federal, and Departmental:

"*Standard.* A description which establishes engineering or technical limitations and applications for materials, processes, methods, designs, drafting room and other engineering practices, or any related criteria deemed essential to achieve the highest practical degree of uniformity in materials or products, or interchangeability of parts used in those products; and which may be used in specifications, invitations for bids, proposals and contracts.

"1. *Federal.* A standard promulgated by the Administration (GSA) for mandatory use by all Federal agencies.

"2. *Interim Federal.* A standard intended for final processing as a new or revised Federal Standard, issued in interim form for optional use by Federal agencies.

"3. *Departmental.* A standard developed and prepared by, and of interest primarily to, a particular agency of the Federal Government, but which may be used by other Federal agencies. This definition applies to MIL Standards, further defined as:

Military (MIL). A standard issued by the Department of Defense, and used solely or predominantly by, and mandatory on, military activities."

Initiation of Federal Standards Projects.—The GSA, after consultation with Federal agencies having interest, may develop a Federal Standard or assign the responsibility therefor to another Federal agency with its consent. After review of civil and military departmental standards which are determined to be of general application throughout the Federal Government, the GSA may initiate the conversion of a departmental standard into a Federal or Interim Federal Standard, following agreement of the appropriate Federal agencies.

Development of Federal Standards.—The procedure for the development of a Federal or Interim Federal Standard by the assigned agency method follows the same general pattern as the procedure for the development of a Federal or Interim Federal Specification.

Standardization Studies.—To facilitate the development of Federal Standards, standardization studies are being undertaken to determine commodity areas which will provide the greatest savings if standardized. Such studies include the analysis of supply catalog data, performance data, ability of industry to produce, and supply management plans and programs. The GSA may initiate or assign standardization studies to another Federal agency with its consent.

Development and Use of Qualified Products Lists

Purpose and Criteria for Issuing Federal Qualified Products List.—Federal Qualified Products Lists are issued by the GSA to furnish information as to the ability of manufacturers to provide products for the Federal Government which meet the requirements of Federal Specifications. Federal QPL's are issued only when the Federal Specification requires that qualification tests be performed *prior to the award of contracts,* which is stated in Paragraph 3.1 Qualifications, under Section 3 —Requirements. Such requirements may be necessary for one or more of the following reasons:

1. The time required for testing after award would unduly delay delivery of the supplies being purchased.
2. The cost of repetitive testing would be excessive.
3. The tests would require expensive or complicated testing apparatus not commonly available.
4. The interest of the Government requires assurance, prior to award, that the product is satisfactory for its intended use.
5. The determination of acceptability would require performance data to supplement technical requirements contained in the specification.

What's in the Name?—The following definitions are established by the GSA relating to qualification of products.

"*Qualified Products List* (QPL). A list of products which have been tested by the qualifying activity and which meet the qualification test requirements of the applicable specification.

"1. *Federal.* A list of products qualified under the applicable Federal or Interim Federal Specification.

"2. *Military.* A list of products qualified under the applicable military specifications.

"*Qualifying Activity.* The activity designated in the specification as responsible for qualification testing for the purpose of developing a qualified products list.

"*Qualification Test.* Such inspection, operation and testing of a product as may be necessary to determine whether or not it conforms to all qualification test requirements of the applicable specification.

"*Qualified Product.* A product which has successfully passed the required qualification test.

"*Manufacturer.* The actual producer of the product. Where the assigned agency considers it justifiable, manufacturer may be construed to include a distributor completely responsible for the distribution of the product and may be dealt with in the same manner as a manufacturer."

Initiation and Assignment of a Federal QPL. — After consultation with Federal agencies having interest, the GSA determines whether a product should be covered by a Federal QPL in connection with a Federal or Interim Federal Specification. The GSA then asigns the responsibility for the development, preparation, continuous review, amendment, and revision, if necessary, to a Federal agency with its consent. The GSA also arranges for a qualifying activity to be named in the applicable Federal or Interim Federal Specification, and recommends to the assigned agency names of manufacturers whose products should be considered.

Acceptance by an Assigned Agency to Develop a Federal QPL. —After the acceptance of the assignment for a QPL, the agency informs manufacturers of the Gov-

ernment's intention to place a product on a Federal QPL, and advises that consideration will be given for purposes of procurement only to products which prior to bid opening date have been tested and approved for inclusion on the Federal QPL.

Request for Qualification of Product by a Manufacturer.—After approval by the assigned agency of a request by a manufacturer for qualification of his product, the assigned agency authorizes the test and furnishes the manufacturer with the name and address of the activity responsible for the qualification tests. The name and address of the office to which inquiries are to be addressed are indicated under NOTES in Section 6 of the applicable Federal or Interim Federal Specification.

Application for Qualification Tests and Certification by Manufacturer.—Application for qualification tests is made by the manufacturer to the qualifying activity. The manufacturer is also required to certify prior to the test that (*a*) he is a producer or responsible distributor of the product and (*b*) he has determined that the product conforms to the applicable specification.

Qualification Tests.—After certification by the manufacturer, qualification tests are conducted at the laboratory designated by the qualifying activity. Samples for qualification tests are selected in accordance with sampling provisions, stated in paragraph 4.1.2 Sampling for Qualification, under Section 4—Sampling, Inspection, and Test Procedures, of the applicable Federal or Interim Federal Specification. The qualifying activity determines the cost of testing and advises the manufacturer of such costs. The results of qualification testing are submitted to the manufacturer by the assigned agency or the qualifying activity.

Preparation and Processing of a Federal QPL by the Assigned Agency.—The assigned agency lists products which have been qualified under the qualification tests and prepares the proposed Federal QPL in accordance with Instructions for Preparation and Processing of Federal Qualified Products Lists and the Flow Chart for Development of Federal Qualified Products Lists included in the Appendix to the GSA Regulation.

Review and Issuance of a Federal QPL by the GSA.—Following a review and approval of a Federal QPL, the GSA issues such lists and distributes them *only* to Federal officials or organizational subdivisions authorized by their agencies to receive them.

Removal of a Product from the Federal QPL.—The GSA may withdraw approval of a product for reasons deemed sufficient and arrange for its removal from the applicable Federal QPL. The GSA may also cancel the entire list.

Restriction on the Use of a QPL for Promotional Purposes.—Reproduction of lists or reference to lists for advertising or promotional purposes is prohibited, and violation will be the cause for removal of a product from the list.

What Will the New Procedures Do?

Through adoption of this more effective method for the development of Federal Specifications and Standards, the General Services Administration expects to meet more adequately the essential supply requirements of the Federal Government. Through broader participation of industry and technical and professional societies in the development of such specifications and standards, the General Services Administration expects that these procurement documents will be kept abreast of new technological developments.

WHAT IS YOUR QUESTION ?

Why do abrasive cut-off wheels fail?

This question was asked by E. J. DeWitt, president of the Wallace Supplies Manufacturing Company, Chicago (*Machinery,* June, 1954) and answered in the same issue.

"The most common cause of wheel breakage may be attributed to excessive speed. Accordingly, it is wise to follow the instructions of the wheel manufacturer. The recommended speed is generally about 84 percent of that at which the manufacturer is required to test his wheels. Centrifugal force increases rapidly above the test speed, so if the safety factor is violated, the wheel may disintegrate when it is forced against the work. The American Standards Association [American Standard Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1-1947] stipulates a surface speed range of 10,000 to 16,000 feet per minute for cut-off wheels of 16 inches or less, and 7500 to 14,000 feet per minute for wheels above 16 inches."

Is a standard available for use in connection with the design of an industrial incinerator for the disposal of gases containing sulfur, sulfur being in the form of hydrogen sulfide?

The American Gas Association's Industrial and Commercial Gas Section has prepared Information Letter, No. 52, on "The Incineration of Commercial and Industrial Waste Materials," that might be helpful. This was published under date of December 5, 1952. The American Standard Approval Requirements for Domestic Gas-Fired Incinerators, Z21.6-1949, reaffirmed in 1952, also contains Addenda approved as Z21.6a-1953. This also may contain information that is applicable although it does not deal specifically with industrial incinerators.

Are there any safety standards limiting the amount of weight an employee can safely lift?

There is a provision in the American Standard Safety Code for Foundries, B8-1932, that the lifting weight for women employees should be limited to 28 lb. There is no provision of this type for men, however.

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering please refer to the number following the title.

003.62 SIGNS, NOTATIONS, SYMBOLS

Spain (IRATRA)

Mathematical symbols — UNE 5010

United Kingdom (BSI)

Railway signaling symbols: Wiring symbols and written circuits — BS 376: Part 2:1954

Letter symbols, signs and abbreviations: Part 1: General — BS 1991: Part 1:1954

332.1 BANKING

France (AFNOR)

Different forms of standard checks — NF K 11-01/02

351 GOVERNMENT LEGISLATION. PUBLIC SERVICES. REGULATIONS

New Zealand (NZSS)

By-law for the control and licensing of boarding houses and similar premises — NZSS 390, June 1952

By-law for the precautions against fire and panic in theatres, public halls, and assembly halls — NZSS 789, August, 1953

534.84 ARCHITECTURAL ACOUSTICS

Czechoslovakia (CSN)

Sound insulation — CSN 1175

537.531 X-RAYS

France (AFNOR)

Generators of X-rays and accessories — NF C 74-100

614.8 PREVENTION OF ACCIDENTS. SAFETY MEASURES

Poland (PKN)

Color- and Symbol-code for designation of dangerous gases — PN Z-08011

615 PHARMACY, THERAPEUTICS

South Africa (SABS)

Standard specification for white open wove bandages — SABS 443-1953

Standard specification for boric (acid) lint — SABS 445-1953

Standard specfication for absorbent lint — SABS 469-1953

United Kingdom (BSI)

Black and white disinfectant fluids — BS 2462:1954

Transfusion equipment for medical use — BS 2463:1954

615.47 MEDICAL INSTRUMENTS. APPARATUS

Czechoslovakia (CSN)

Taper end, type "Record," for injection syringe — CSN 85 5610

United Kingdom (BSI)

Maternity cribs (metal) — BS 2097:1954

615.777 DISINFECTANTS. ANTISEPTICS. INSECTICIDES

New Zealand (NZSS)

Standard specification for requirements for rat and mouse poisons — NZSS 1034, April, 1953

621.88 MEANS OF ATTACHMENT. FASTENERS

Austria (ÖNA)

Hexagon head bolts with and without dog point — ÖNORM M 5101, 5103

Two types machine screws, metric — ÖNORM M 5135/36

Square hammer-head bolts, metric — ÖNORM M 5138

Four types of studs, metric — ÖNORM M 5154/57

Hexagon nuts, low type, metric — ÖNORM M 5211

Square nuts, metric — ÖNORM M 5214

Hexagon nuts, fine metric thread — ÖNORM M 5225

Hexagon nuts, standard size, types m and mg — ÖNORM M 5240

Slotted nuts, round — ÖNORM M 5250

Canada (CSA)

Specification for 1½-inch fire hose couplings screw thread and tail piece internal diameters — B89-1954

Specification for 2½-inch fire hose couplings and fittings — B89.2-1954

Czechoslovakia (CSN)

Six standards for methods of packing fastenings 02 5870, 49 1710, 50 5105, 50 5135 — CSN 02 0050/51,

Six standards for set collars — CSN 02 2910/12, -2914, -2930/31

Finland (SFS)

Whitworth pipe thread, nominal size ⅛ in. to 12 in. — B. I. 5

Straight thread for fittings ⅛ in. to 6 in. — B. I. 7

Taper thread for fittings ⅛ in. to 6 in. — B. I. 8

Contact screw, metric 2, 6 to 10 — B. V. 30

Germany (DNA)

Screw threads run-out, metric and Whitworth — DIN 444, B1.1

Hexagon head registering bolts — DIN 609/10

Studs for screwing in grey cast iron, metric — DIN 939, B1.1

Mushroom-head rivets — DIN 674

Low hexagon nuts, metric thread — DIN 936

Screws, nuts, etc. General delivery specifications — DIN 267

Round washers — DIN 433

Several types of safety washers — DIN 522

Snapsprings for shaft and holes — DIN 471/72

Countersunk head of screws. Dimensions — DIN 75, B1.1

Low oval large-head screws — DIN 921

Studs, threaded both ends — DIN 940, B1.1

Round slotted or drilled nuts — DIN 546/B

Castle nuts — DIN 935, B1.1; -937

Tonged sheet metal safety washers — DIN 93

Hooked safety washers — DIN 432

Safety rings — DIN 471/72

Bolts, M5-M36, round hexagon socket head — DIN 6912

India (ISI)

Wood screws — IS 451

Japan (JISC)

Machine screws — JIS B 1101

Spain (IRATRA)

Screws. Definitions — UNE 17001

Screw threads. Basic dimensions — UNE 17005

Hook spanners — UNE 26073

Spring stop rings — UNE 26074/75

Rivets, nomenclature and graphical representation — UNE 17003

Sweden (SIS)

Spring washers, types FBA and FBB — SMS 84

United Kingdom (BSI)

Groove riders for axles — SMS 1583

Black taper washers — BS 2466:1954

622 MINING

Czechoslovakia (CSN)

3 types of mining drills — CSN 45 1225/27

4 standards for different types of miner's shovels — CSN 237115, -237119, -237128, -237187

2 standards for mining wagons for surface work — CSN 281711/12

France (AFNOR)

4 standards for component parts of oscillating shoot for coal mines — NF M 81-611/14

Narrow gage rails for coal mines — NF M 81-700

Nominal rating of pneumatic rotating motors for coal mines — NF M 82-200

Germany (DNA)

4 standards for mining shovels and handles — DIN 20124, -20127, -20151/52

Mattock, single-end — DIN 20105

Mattock and pick combination — DIN 20109

Pick and hammer combination — DIN 20110

2 types of miners' spades — DIN 20112

Miner's ax — DIN 20115

Miner's hammers — DIN 20135/6

Stretcher for use in mines — DIN 23400 B1.1

Explosion-proof lamp for lighting mines — DIN 22431

Sweden (SIS)

Miner's mattock — SMS 1589

Miner's crow-bar — SMS 1591

United Kingdom (BSI)

Coal cutter's picks and pick boxes — BS 2477:1954

624 CIVIL ENGINEERING

Austria (ÖNA)

Calculation and construction of reinforced concrete structures — ÖNORM B 4200 Part 4

Czechoslovakia (CSN)

Steel structural parts for industrial building — CSN 74 5610

Brick buildings, standard requirement — CSN 73 1311

Admissible static load on bridges — CSN 73 6202

Germany (DNA)

Pre-stressed concrete; general directions for use — DIN 4227
Height of flights and number of steps — DIN 4174

Poland (PKN)

Specifications for brick masonry — PN B-06060
Lowest temperature allowable for buildings and unheated rooms — PN B-02403

Spain (IRATRA)

Determination of inner room-space in buildings — UNE 24014
Determination of the cost of cubic meter of building — UNE 24015

625.1/8 RAILWAYS AND TRAMWAYS. ROADS

France (AFNOR)

Large unfinished nuts for fixed railway installations — NF F 50-007
2 types of beater pick — NF F 76-007/008
5 standards for different types of railway springs and their parts — NF F 01-046/051

Germany (DNA)

Steel sleepers, 15 kg/m type — DIN 5904

Italy (UNI)

Rail sections, types 21, 27, 30, 36, 46 and 49 dimensions and tolerances — UNI 3141

Spain (IRATRA)

Lag screws — UNE 25039
Ceiling light globe for passenger cars — UNE 25031
Lenticular joint rings — UNE 25044
Nomenclature of steam locomotives — UNE 25056
Nomenclature of Diesel locomotives — UNE 25076
5 standards for rails types 30, 35, 40, 45, and 50 kg/m — UNE 25069/73

United Kingdom (BSI)

Glossary of highway engineering terms — BS 892:1954
White line road paint — BS 2086:1954
Bitumen macadam with crushed rock or slag aggregate — BS 1621:1954
Method of testing oil-fired rotary dryers for use in asphalt and coated macadam plant — BS 2096: 1954

628.2 SEWERS

Austria (ONA)

Sediment trap for flammable liquids — ÖNORM B 5101

Germany (DNA)

Access pipe for cleaning drain pipe — DIN 1392, Bl.1, 2
Different types of street drain water outlet grates — DIN 597
Sediment traps — DIN 4282/83
Layout of public sewage lines — DIN 4050
Sediment traps — DIN 4286, Bl.1, 2, 3
4 standards for street drain grids — DIN 1207, Bl.1/4

Ireland (IIRS)

Clayware land draining pipes — IS 58
Pressed steel rainwater goods — IS 59

Netherlands (HCNN)

Salt-glazed pipes — N 62
Concrete pipes — N 370
Septic tanks — V 2126

629.11 LAND VEHICLES. TRANSPORT ENGINEERING

Czechoslovakia (CSN)

Method of determination of fuel consumption in auto-tractor depots — CSN 30 0510
Standard location of control pedals in automobiles — CSN 30 3030
Marking of disk wheels of trucks and buses — CSN 30 3709

France (AFNOR)

Automobile cylindrical shaft ends — NF R 131-06
Automobile spark plugs — NF R 133-14
Bicycle rims — PN R 327-01
Gaging tape for bicycle rims — PN R 327-30

Germany (DNA)

Tires for motorcycles and automobiles, 15-in.—19-in. diam — DIN 7802/03
Distance between wheel centers of agricultural tractors — DIN 9621
Riveting-nut — DIN 70808
Automobile tire valves — DIN 7760, -7769
Thread for tire valves — DIN 7756
Rim-form of 13-in. and 15-in. wheels — DIN 7817
Rules for stamping identification number on chassis — DIN 70025
6 standards for automobile-type bolts and nuts — DIN 70613/18
Different types of clamps for lubricating pipes — DIN 71434
12 standards for different types of tire valves — DIN 7757/58, 7761/64, 7768, 7770/74
Nomenclature of automobile parts — DIN 70023
Trailer coupling bar — DIN 74054
Fork joints — DIN 71751/52
Flexible shaft instrument connection — DIN 75532
Hydraulic brakes: dimension and tolerances — DIN 74200

Spain (IRATRA)

Distributors — UNE 10036
Piston rings — UNE 10017, -10019
Starters — UNE 10041
Fuel pump — UNE 10042
Fixed magneto flywheels — UNE 10043
Valves — UNE 10044
Carburetor valve command lever — UNE 10045
3 types oil-retaining rings — UNE 26076/78
3 types electric switches — UNE 26100/02
Elastic bushing — UNE 26094
Fuses and fuse-block — UNE 26095/96
Fuel pump details — UNE 26097

Sweden (SIS)

2 standards for different types of lubricating nipples — SMS 1585, 1568

629.12 SHIPS AND SHIPBUILDING

France (AFNOR)

Bitts and hawseholes, general specifications — NF J 37-210
4 standards for different types of bitts — NF J 37-212/14, 216
3 standards for different forms of hawseholes — NF J 37-272, -274, 280
Fire hose nozzle-holding clamp — NF J 41-645
21 standards for the installation of types A, B and C of tank sounding devices on shipboard and their accessories all included in the series: — NF J 45-700/788
Portholes on river ships: classification, terminology, designation — NF J 83-110

Italy (UNI)

37 standards for different types of valves and their components for marine pipes, heavy series and of different sizes — UNI 3407/43
9 standards for sediment traps and their components for marine pipes — UNI 3444/52
4 standards for marine eyebolts, hexagon head bolts, studs — UNI 3453/6

Netherlands (HCNN)

D-shackles — N 964

632 PROTECTION OF PLANTS. DISEASES AND PESTS

Canada (CSA)

Standard for insecticide vaporizers (continuous type) — CSA Z129-1954

France (AFNOR)

Phytopharmaceutical products, terminology — NF U 43-000
Raw material used for phytopharmaceutical products, terminology — NF U 43-200
Heavy petroleum oils used for the manufacturing of insecticides. Specification — NF U 43-214

666 GLASS AND CERAMIC INDUSTRY. ARTIFICIAL STONE

Argentina (IRAM)

Sampling — IRAM 1535
Pyrometric cones for testing refractories — IRAM 1545
5 standards for refractory bricks and their testing — IRAM 1553, 1555/56

Australia (SAA)

Standard specification for dental artificial stone — AS No. T.7-1953
Standard specification for dental silicate cement — AS No. T.8-1953

France (AFNOR)

Chemical analysis of refractories of silicon carbide base — NF B 49-443

Germany (DNA)

Milk bottles — DIN 5101
Yoghurt jar — DIN 6088

India (ISI)

Fireclay refractories for oil-fired boilers — IS:483
Moderate heat duty fireclay refractories "A" and "B" — IS:6/7
High heat duty fireclay refractories — IS:8
Silica refractories for general purpose — IS 484

Ireland (IIRS)

Clayware flue liners for open fires — IS 51

Japan (JISC)

Plaster of paris mold for pottery — JIS R 9111
Natural gypsum for cement — JIS R 9151

Norway (NSF)

Quality requirements and test specifications for Portland cement — NS 425 A

United Kingdom (BSI)

Methods of test for chemical stoneware — BS 784:1953

677 TEXTILE INDUSTRY

Belgium (IBN)

Gravimetric method for determination of yarn number — NBN 308
Ropes for hoisting machines and marine use. Terminology, specifications and size tables — NBN 318

Germany (DNA)

Felt, different grades — DIN 61200
Spinning machine for cops-winding — DIN 64012

India (ISI)

Method for visual and tactual examination of category I raw silk — IS:462

Method for determining conditioned weight of category I raw silk	IS:463
Method for conducting size (denier) deviation and maximum deviation tests for category I raw silk	IS:465
Method for conducting average conditioned size (denier) test for category I raw silk	IS:466
Method for conducting evenness and low evenness tests for category I raw silk	IS:467
Method for conducting cleanness test for category I raw silk	IS:468
Method for conducting neatness test for category I raw silk	IS:469
Method for conducting serigraph test for determining the tenacity and elongation of category I raw silk	IS:470
Method for conducting cohesion test for category I raw silk	IS:471
Method for visual and tactual examination of category I raw silk	IS:472
Method for determining conditioned weight of category I raw silk	IS:473
Method for conducting winding test for category II raw silk	IS:474
Method of grading raw silk	IS:461
Method for conducting winding test for category I raw silk	IS:464
7 standards for methods for conducting different tests for category II raw silk such as: size deviation, average conditioned size, evenness, cleanness, neatness, tenacity and cohesion	IS:475/481

Ireland (IIRS)

Irish homespun tweed	IS 29
Cotton dungaree cloth	IS 49

Japan (JISC)

Inspection standards for braids and narrow woven fabrics	JIS L 1620/1

Sweden (SIS)

4 color fastness tests: alkali, acid, carbonization and boiling soda	SIS 65 00 27/30

United Kingdom (BSI)

Dimensions of textile coiler cans	BS 2047:1953
Ropes made from coir, hemp, manila and sisal	BS 2052:1953
Plaited sash cords (hemp)	BS 606:1954
Twist in yarn in package form	BS 2085:1954
Chemical requirements for treated textiles	BS 2087:1954

678 RUBBER INDUSTRY

France (AFNOR)

Rubber gas hoses, 12 mm for domestic purposes	NF T 47-114

Germany (DNA)

2 standards for testing rubber	DIN 53305/6

United Kingdom (BSI)

Tests for resistivity of conductive and anti-static rubbers	BS 2044:1953
Balata belting	BS 2066:1953

What's New on American Standard Projects

General Industrial Stairs, A64—

Sponsor: National Safety Council

A sectional committee is now being organized by the sponsor under ASA procedure, to develop standards on this subject. Scope of the committee's work will be "Standards for the safe design and construction of general industrial stairs other than those used exclusively for fire exit purposes, including interior and exterior stairs around machinery, tanks, and other equipment and stairs leading to or from floors, platforms or pits. These standards do not apply to construction operations or to private residences."

Small Tools and Machine Tool Elements, B5—

Sponsors: The American Society of Mechanical Engineers; National Machine Tool Builders Association; Metal Cutting Tool Institute; the Society of Automotive Engineers

How Technical Committee 18 Worked on New Standard

by Robert A. Schafer

National Automatic Tool Company, Inc, Richmond, Indiana; Chairman, Technical Committee 18.

The need for adjustable adapters for multiple spindle drilling heads was explored by Sectional Committee B5 as early as September 1922, and the standard itself was approved in 1937 as American Standard B5.11-1937. Its purpose was to provide dimensions for adapters, which secure vertical adjustment for taper shank tools when used with multiple spindle drilling heads.

At the request of the sponsor organizations, a new technical committee was appointed in 1947 to review the 1937 edition and recommend revisions. In 1953 this committee was authorized to revise the standard and to include spindle noses as well as adjustable adapters. The final draft of this revision was completed December 31, 1953, with the title, Spindle Noses and Adjustable Adapters for Multiple Spindle Drilling Heads. This proposed revision was presented to Sectional Committee B5 for vote by letter ballot February 1954. In April 1954, the committee, consisting of 36 members, voted approval for the proposed revision. After approval by the four sponsor bodies, the revision was submitted to the American Standards Association and has now been approved as American Standard.

The responsibility for all the technical work done on this subject would not have given the chairman so much pleasure had it not been for the full cooperation of the members of his committee and of all other chairmen of the various committees to which the material has been transmitted for approval. He is grateful for their prompt handling of this material.

In addition to the chairman, who has been a member of the committee since 1948 and chairman since December 1951, the other members of Technical Committee 18 are: B. R. Better, Director of Research, Scully-Jones & Company, Chicago; G. D. Stewart, Chief Engineer, Machine Division, Ex-Cell-O Corporation, Detroit, Mich; J. O. Snyder, Liaison, Chief Machinery and Tool Sub Unit, Engineering Division Air Corps, Wright Field, Dayton, Ohio; C. M. Williamson, Assistant Master Mechanic, General Motors Corporation, Rochester, N. Y.

Acoustics, Vibration, and Shock, Z24—

Sponsor: Acoustical Society of America

At present no replacement is available for the recently withdrawn American Standard Noise Measurement, Z24.2-1942. A number of subcommittees of the Z24 Sectional Committee are at work on various phases of this problem, and when their work is completed, the new standard will be announced in THE MAGAZINE OF STANDARDS.

Correct Your Standard

American Standard Dimensions for 35-Millimeter Film Magazines for Still Picture Cameras, PH1.14-1953, should be corrected to read as follows:

Dimension Y Millimeters 30.0 max Inches 1.181

AMERICAN STANDARDS

Status as of October 13, 1954

Legend

Standards Council—Approval of Standards Council is final approval as American Standard; usually requires 4 weeks.

Board of Review — Acts for Standards Council and gives final approval as American Standard; action usually requires 2 weeks.

Standards Boards — Approve standards to send to Standards Council or Board of Review for final action; approval by standards boards usually takes 4 weeks.

Acoustics

In Board of Review —

Method for the Free-Field Secondary Calibration of Microphones, Z24.11
Sponsor: Acoustical Society of America

Withdrawal Requested —

American Standard of the American Standard Noise Measurement, Z24.2-1942
Sponsor: Acoustical Society of America

Arbitration

Standard Submitted —

Commercial Arbitration, Z73
Sponsor: American Arbitration Association

Building

In Standards Board —

Methods of Fire Tests of Building Construction and Materials, A2
Sponsors: National Fire Protection Association; American Society for Testing Materials; National Bureau of Standards

National Plumbing Code, A40.8
Sponsors: The American Public Health Association; The American Society of Mechanical Engineers

Building Code Requirements for Minimum Design Loads in Buildings and Other Structures, A58.1 (Revision of A58.1-1945)
Sponsor: National Bureau of Standards

Withdrawal Being Considered —

Plumbing Code, A40.7-1949
Sponsors: American Public Health Association; American Society of Mechanical Engineers

NOTE: With approval of the National Plumbing Code, A40.8, this standard will be withdrawn

Chemical Industry

American Standards Published —

Method of Test for Acetone Extract in Black Pigments, ASTM D305-51; ASA K55.1-1954 (Revision of ASTM D305-31; ASA K55.1-1941) $0.25

Methods for Chemical Analysis of Yellow, Orange, and Green Pigments Containing Lead Chromate, and Chromium Oxide Green, ASTM D126-50T; ASA K58.1-1954 (Revision of ASTM D126-36; ASA K58-1941) $0.25

Pure Para Red Toner, Light, Specifications for, ASTM D475-49; ASA K49.1-1954 (Revision of ASTM D475-41; ASA K49-1941) $0.25
Sponsor: American Society for Testing Materials

Drawings and Symbols

American Standard Approved —

Letter Symbols for Aeronautical Sciences, Z10.7-1954 (Revision of Z10.7-1950)
Sponsor: American Society of Mechanical Engineers

Standards Withdrawn —

Graphical Symbols for Single (One) Line Electrical Engineering Diagrams, Y32.-1.1-1951

Graphical Symbols for Electric Power and Control, Z32.3-1946

Graphical Symbols for Telephone, Telegraph, and Radio Use, Z32.5-1944

Graphical Symbols for Electron Devices, Z32.10-1948

Basic Graphical Symbols for Electric Apparatus, Z32.12-1947
Sponsors: American Institute of Electrical Engineers; American Society of Mechanical Engineers

Electrical

American Standards Published —

Low Voltage Air Circuit Breakers (Including Application Guide), C37.13-1954 $0.80

Test Code for Low Voltage Air Circuit Breakers, C37.14-1954 $0.50

Rated Control Voltages and Their Ranges for Low Voltage Air Circuit Breakers, C37.15-1954 $0.30
Sponsor: Electrical Standards Board

American Standards Approved —

Electrical and Mechanical Characteristics of Apparatus Bushings, C37.4a-1954 (Supplement to Alternating-Current Power Circuit Breakers C37.4-1953) and C57.12b-1954 (Supplement to Distribution, Power, and Regulating Transformers, and Reactors other than Current-Limiting Reactors, C57.12-1949)

Miniature Incadescent Lamps, C78.140-1954 (Revision of C78.140-1953)

Nomenclature for Glass Bulbs, C79.1-1954 (Revision of C79.1-1948)

Nomenclature for Molded Glass Flares, C79.2-1954 (Revision of C79.2-1948)
Sponsor: Electrical Standards Board

Definitions of Terms for Antennas and Waveguides, C16.21-1954
Sponsor: Institute of Radio Engineers

Dry Cells and Batteries, Specification for, C18.1-1954 (Revision of C18-1947)
Sponsor: National Bureau of Standards

Distribution, Power, and Regulating Transformers, and Reactors other than Current-Limiting Reactors, C57.12-1954 (Revision of C57.12-1949)

In Board of Review —

American Recommended Practice for Volume Measurements of Electrical Speech and Program Waves, C14.5-1954 (Revision of C16.5-1942)
Sponsor: Institute of Radio Engineers

In Standards Board —

Power-Operated Radio Receiving Appliances, C65.1-1954 (Revision of C65.1-1952)
Sponsor: Underwriters' Laboratories, Inc

Proposed Project on Terminology for Automatic Controls, C85
Sponsor: Electrical Standards Board

Standard Submitted —

Standards of Circuits: Definitions of Terms in the Field of Linear Varying Parameter and Nonlinear Circuits
Submitted by: Institute of Radio Engineers

Gas Burning Appliances

American Standards Approved —

Addenda (Z21.1b-1954) to American Standard Approved Requirements for Domestic Gas Ranges, Z21.1-1952

Addenda (Z21.5a-1954) to American Standard Approval Requirements for Domestic Gas Clothes Dryers, Z21.5-1953

Addenda (Z21.6b-1954) to American Standard Approval Requirements for Domestic Gas-Fired Incinerators, Z21.6-1949, R1952

Addenda (Z21.10a-1954) to American Standard Approval Requirements for Gas Water Heaters, Z21.10-1953

Addenda (Z21.13.1a-1954) to American Standard Approval Requirements for Central Heating Gas Appliances, Volume I, Steam and Hot Water Boilers, Z21.13.1-1951

Addenda (Z21.13.2b-1954) to American Standard Approval Requirements for Central Heating Gas Appliances, Volume II, Gravity and Forced Air Central Furnaces, Z21.13.2-1951

Addenda (Z21.13.3a-1954) to American Standard Approval Requirements for Central Heating Gas Appliances, Volume III, Gravity and Fan-Type Floor Furnaces, Z21.13.3-1951

Addenda (Z21.13.4a-1954) to American Standard Approval Requirements for Central Heating Gas Appliances, Volume IV, Gravity and Fan-Type Vented Recessed Heaters, Z21.13.4-1951

Addenda (Z21.28a-1954) to American Standard Approval Requirements for Portable Gas Baking and Roasting Ovens, Z21.28-1948

Addenda (Z21.31a-1954) to American Standard Approval Requirements for Gas Counter Appliances, Z21.31-1941, R1947

Addenda (Z21.34a-1954) to American Standard Approval Requirements for Gas-Fired Duct Furnaces, Z21.34-1942, R1950

Listing Requirements for Gas Valves, Z21.15-1954, (Revision of Z21.15-1944, R1952)

Requirements for Gas-Fired Room Heaters, Z21.11-1954 (Revision of Z21.-11-1949)
Sponsor: American Gas Association

Mechanical

American Standards Published —

Chucks and Chuck Jaws, B5.8-1954 (Revision of B5.8-1936) $1.00

Machine Pins, B5.20-1954 (Revision of B5.20-1947) $1.00

Spindle Noses for Tool Room Lathes, Engine Lathes, Turret Lathes, and Automatic Lathes, B5.9-1954 (Revision of B5.9-1948) $1.75

Spindle Noses and Adjustable Adaptors for Multiple Spindle Drilling Heads, B5.11-1954 (Revision of B5.11-1937) $1.00

Sponsors: Metal Cutting Tool Institute; Society of Automotive Engineers; National Machine Tool Builders Association; The American Society of Mechanical Engineers

Malleable Iron Detachable Link Chain and Attachments, B29.7-1954 $3.00

Refrigeration Flare-Type Fittings, B70.1-1954 $2.00

Steel Detachable Link Chain and Attachments, B29.6-1954 $2.00

Sponsors: The American Society of Mechanical Engineers; The Society of Automotive Engineers, Inc

American Standards Approved —

Circular and Dovetailed Forming Tool Blanks, B5.7-1954 (Revision of Circular and Dovetail Forming Tool Blanks, B5.7-1948)

Sponsors: American Society of Mechanical Engineers; Metal Cutting Tool Institute; National Machine Tool Builders Association; Society of Automotive Engineers

Socket Head Cap Screws and Socket Set Screws, B18.3-1954 (Revision of B18.3-1947)

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Requirements for Five-Quart and One-Gallon Round Cans, B64.2-1954

Requirements for Oblong Oil Cans, B64.3-1954

Requirements for Grease Cans, B64.4-1954

In Standards Board —

Gear Nomenclature (Terms, Definitions, and illustrations), B6.10 (Revision of B6.10-1950)

Letter Symbols for Gear Engineering, B6.5 (Revision of B6.5-1949)

Nomenclature for Gear Tooth Wear and Failure, B6.12

Sponsors: American Gear Manufacturers Association; American Society of Mechanical Engineers

Withdrawal Being Considered —

Code for Design of Transmission Shafting, B17c-1927 R1947

Woodruff Keys, Keyslots, and Cutters, B17f-1930 R1947

Shafting and Stock Keys, B17.1-1943

Sponsor: American Society of Mechanical Engineers

Withdrawal Requested —

Rotary Cone Valves, B61

Requested by: American Society of Mechanical Engineers

Motion Pictures

American Standards Approved —

Cross-Modulation Tests, 16mm Variable-Area Photographic Sound, PH22.52-1954 (Revision of Z22.52-1946)

Aperture for 35mm Sound Motion Picture Projectors, PH22.58-1954 (Revision of Z22.58-1947)

Aperture for 35mm Sound Motion Picture Cameras, PH22.59-1954 (Revision of Z22.59-1947)

Television Picture Area—35mm Motion Picture Film, PH22.95-1954

Television Picture Area—16mm Motion Picture Film, PH22.96-1954

Sponsor: Society of Motion Picture and Television Engineers

Office Equipment

American Standards Approved —

Definition of Posture Chair, X2.1.4-1954

Length of Cables for Office Dictation Machines, X2.5.19-1954

Maximum Electrical Leakage of Dictating Machines, X2.5.17-1954

Operating Voltage Range of Office Dictating Equipment, X2.5.16-1954

Sponsor: National Office Management Association

In Board of Review —

Specifications for Non-Carbonized, Single Ply, Adding Machine Paper Rolls, X2.-4.2

Sponsor: National Office Management Association

In Standards Board —

Reflectances of Furniture for General Office Use, X2.1.3

Template and Method of Attaching Dictating Machine Secretarian Hand Controls to Typewriters, X2.5.18

Sponsor: National Office Management Association

Photography

American Standards Approved —

Method for Determining Spectral-Sensitivity Indexes and Group Numbers for Photographic Emulsions, PH2.6-1954 (Revision of Z38.2.4-1946)

Photographic Grade Sodium Metaborate Octahydrate, PH4.231-1954 (Revision of Z38.8.231-1948)

Photographic Grade Sodium Tetraborate, Pentahydrate, PH4.233-1954

Reaffirmation Approved

Dimensions for Radiographic Intensifying Screens, PH3.19-1954 (Reaffirmation of Z38.1.50-1948)

Reaffirmation Being Considered —

Dimensions for Bite of Film Clips, PH4.-15 (Reaffirmation of Z38.8.4-1945)

In Standards Board —

Dimensions for 70mm Perforated Film for Cameras Other Than Motion Picture Cameras, PH1.20

Focal Length of Lenses: Markings, PH3.-13 (Revision of Z38.4.4-1942)

Specifications for Threads for Attaching Mounted Lenses to Photographic Equipment, PH3.10 (Revision of Z38.4.11-1944)

Photographic Grade Sodium Tetraborate, Decahydrate (Borax), PH4.230 (Revision of Z38.8.230-1948)

Photographic Grade Chemicals: Monopara-aminophenol Hydrochloride, PH-4.135

Photographic Grade Chemicals: Isopropylamine, 50-Percent Aqueous Solution, PH4.178

Photographic Grade Chemicals: Benzyl Alcohol, PH4.181

Photographic Grade Chemicals: Sodium Carbonate, Monohydrates, PH4.227 (Revision of Z38.8.227-1948)

Photographic Grade Chemicals: Sodium Carbonate, Anhydrous, PH4.228 (Revision of Z38.8.228-1948)

Sponsor: Photographic Standards Board

Safety

In Standards Board —

Quarry Safety Code, M28.1

Sponsor: National Safety Council

Textiles

American Standard Published —

Specifications and Methods of Test for Fineness of Wool Tops, ASTM D472-53T; ASA L14.29-1954 (Revision of ASTM D472-50T; ASA L14.29-1951) $0.25

Sponsor: American Society for Testing Materials; American Association of Textile Chemists and Colorists

American Standards Approved —

Methods of Test for Clean Wool Content of Wool in the Grease, ASTM D584-53T; ASA L14.40-1954 (Revision of ASTM D584-527; ASA L14.40-1953)

Methods of Testing and Tolerances for Certain Wool and Part Wool Fabrics, ASTM D462-53; ASA L14.28-1954 (Revision of ASTM D462-52; ASA L14.28-1953)

Specifications for Textile Testing Machines, ASTM D76-53; ASA L14.66-1954 (Revision of ASTM D76-49; ASA L14.66-1951)

Definitions of Terms in Relation to Textile Materials, ASTM D123-53; ASA L14.12-1954 (Revision of ASTM D123-52; ASA L14.12-1953)

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NBS Adopts International Nautical Mile

The National Bureau of Standards announced recently that it is now using the International Nautical Mile. This is in line with an agreement between the Secretary of Commerce and the Secretary of Defense to use the International Nautical Mile within their respective departments.

The International Nautical Mile is 1852 meters (6076.10333 feet), slightly shorter than the U.S. nautical mile of 1853.248 meters (6080.20 feet).

The International Nautical Mile was first put into effect in 1929 when the International Hydrographic Bureau obtained an agree-

ment from a large number of countries to adopt a value of 1852 meters. At that time, however, Great Britain, the USSR, and the United States did not accept this value, each country preferring to retain the nautical mile to which it had been accustomed. The British and the U.S. nautical miles, although each derived by taking 60 nautical miles per degree, differed in the values adopted. The nautical mile adopted by the British Admiralty equals 6080 British feet, while the U.S. nautical mile has had the adopted value of 1853.248 meters, from which the equivalent 6080.2 U.S. feet has been derived. The British foot is shorter than the U.S. foot by 1 part in 400,000.

The present decision to adopt the International Nautical Mile was made by the Departments of Commerce and Defense after a committee indicated that the change would not affect nautical charts, the calibration of navigational instruments, or navigation.

• • **Max Reimer,** recently promoted to Chief Draftsman of the Worthington Corporation's Harrison Works and Manager of the Engineering Services Division, is secretary of the Metropolitan Section of the Standards Engineers Society. Mr Riemer is chairman of the Company's Standards Subcommittee dealing with drafting room practice and a member of the Harrison Works Main Standards Committee. He is in charge of administering all standards at the Harrison Works. Mr Reimer is a graduate of Ohm Polytechnic Institute of Nuremberg, Germany.

• • **More than 400 suggested revisions** to the Uniform Building Code were processed at the 32nd Annual Business Meeting of the Pacific Coast Building Officials Conference during the week ending October 8. Significant changes concerned the masonry, lumber, and heating and ventilating provisions of the code.

In addition to sessions concerning code changes, a workshop for building officials was held.

Gilbert E. Morris, superintendent of building, Los Angeles, California, was re-elected president.

STANDARDS OUTLOOK

by LEO B. MOORE

HUMAN RELATIONS

The general concern of industry for good human relations has paid off. Main consideration in the past has been given to employee relations and has been extended to the supplier, the customer, and the community; all in the endeavor to create and maintain harmonious and satisfactory relationships with the people who contribute to the success of the enterprise. Many companies are now realizing the value of the same concern as an intimate part of every improvement activity in the company—cost reduction, waste elimination, work simplification, industrial engineering, and safety, to cite some examples. The same thinking applies to standards activity.

Many standards programs are plagued with the problem of gaining wholehearted acceptance and use of standards by certain functions of the business. There are endless discussions of the problem of some group violating the spirit and frustrating the efforts of the standards department by avoiding the use of promulgated standards. No standards man would ever insist that standards be used without regard to the situation and circumstances involved, but how many have ever wondered whether these groups need something more than the printed word to gain their cooperation?

In the nature of things, standards are decisions and as such, many of them cause change in one form or another. The first reaction to a new standard is that it tells us what to do, and as freedom-loving people we resent it to some degree. We may even find adequate reason to see in it some criticism of ourselves or what we do. We resent it, and resenting it, resist it. This may be an unconscious reaction on our part, but it is, nevertheless, real and reflects itself in our thinking.

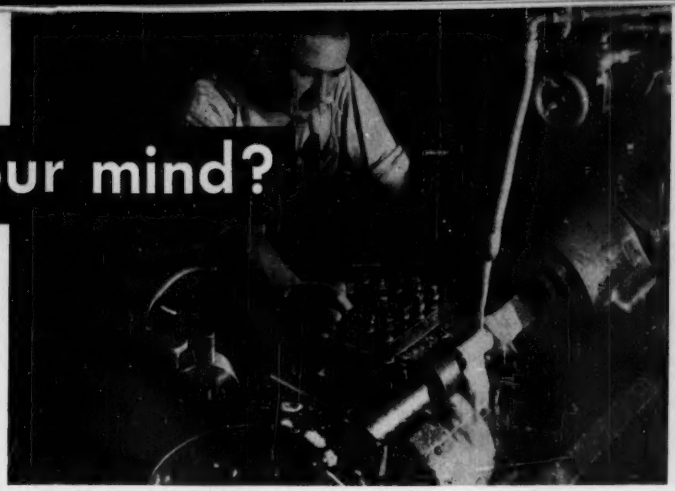
This natural, normal human reaction to change may be overcome through the process of participation. Through participation, the opportunity to contribute is presented to those who are in a position to react. In contribution, the commonsense of the individual allays the possible resistance and resentment and the new is accepted willingly because the change becomes the participant's idea. This process takes time. It requires an extreme sensitivity to all the human relations problems involved in a situation, but it pays for itself in better understanding and real acceptance.

Should we not use more of these ideas in standards work? Would it be too much to permit everyone concerned with a new standard to have his say about it before promulgation? Better still, could it be arranged for the person or persons in a situation to suggest the advisability of having a standard and of working with the standards engineer, if not in its preparation, at least in its development? Could more time be taken to find persons with problems that will be solved with standards? Rather than issuing a standard almost as a surprise, could it be approved and expected in advance of publication?

Since every phase of standards work involves people, it would seem wise to give special consideration to the human relations problems involved.

Mr Moore is Assistant Professor of Industrial Management at the Massachusetts Institute of Technology where he teaches a full-term course in industrial standardization.

machine tools on your mind?



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